GeoExplorer® 3

Operation Guide

Version 1.20

Part Number 39628-20-ENG

Revision A

May 2001

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About This Manual

Welcome to the *GeoExplorer 3 Operation Guide*. This manual describes how to install, set up, and use the Trimble GeoExplorer® 3 mapping system.

Scope and Audience

Even if you have used other Global Positioning System (GPS) products before, we recommend that you spend some time reading this manual to learn about the special features of this product. If you are not familiar with GPS, we suggest that you read the booklet *GPS, A Guide to the Next Utility* that is available from Trimble Navigation Limited.

We assume that you are familiar with Microsoft Windows, and know how to use a mouse, select options from menus and dialog boxes, make selections from lists, and use online Help. For a review of these techniques, refer to your Windows documentation.

The following sections provide you with a guide to this manual, as well as to other documentation that you may have received with this product.

Organization

This manual is divided into the following areas:

- SYSTEM OVERVIEW

  This System overview provides general information about the GeoExplorer 3 mapping system, its components, and accessories.

- TUTORIAL

  The Tutorial provides step-by-step instructions for some of the tasks that you will perform when using the GeoExplorer 3 mapping system. Two of the primary functions of the GeoExplorer 3 are data collection and data update. You will learn how to:

  - prepare to collect data

  - collect data

  - process the data

  - prepare to update the data

  - update the data

- ADVANCED FUNCTIONS

  When using the GeoExplorer 3 mapping system to collect and update data, you can use a variety of advanced functions to provide more accurate and efficient results. The following topics are covered:

  - advanced data collection

  - carrier phase data collection

  - coordinate systems

- REFERENCE

  The Reference provides detailed information about screens that appear when you use the GeoExplorer 3 mapping system.

  The Reference describes different ways to interact with the GeoExplorer 3. It also explains how to use the keys and screens. Other topics correspond to the three different sections of the software:

  - SYS section

  - DATA section

  - NAV section

  The Reference also contains information on potential problems and how to solve them, as well as the technical specifications of the GeoExplorer 3 handheld and information about NMEA Output messages.

- In addition, there is a glossary which contains definitions of words and terms used in this manual.

Related Information

The following sections discuss other sources of information that introduce, extend, or update this manual.

Release Notes

The release notes describe new features of the product, information not included in the manuals, and any changes to the manuals.

Other Information

This section lists sources that provide other useful information.

World Wide Web (WWW) Site

For an interactive look at Trimble, visit our site on the World Wide Web (http://www.trimble.com).

File Transfer Protocol (FTP) Site

Use the Trimble FTP site to send files or to receive files such as software patches, utilities, and answers to Frequently Asked Questions (FAQs). The address is ftp://ftp.trimble.com.

You can also access the FTP site from the Trimble World Wide Web site (http://www.trimble.com/support/support.htm).

Technical Assistance

If you have a problem and cannot find the information you need in the product documentation, *contact your local dealer*.

Reader Feedback

Thank you for purchasing this product. We would appreciate your feedback about the documentation. Your feedback will help us to improve future revisions. Contributors of particularly helpful evaluations will receive a thank-you gift.

To forward your feedback, do one of the following:

- send an email to ReaderFeedback@trimble.com

- complete and fax or post the reader comment form at the back of this manual to the attention of the Documentation Group. (If the reader comment form is not available, send comments and suggestions to the address in the front of this manual.)

All comments and suggestions become the property of Trimble Navigation Limited.

Thank you for your help.

Document Conventions

Courier represents messages printed on the screen.

Courier Bold represents information that you must type in a software screen or window.

Helvetica Narrow Bold identifies a software command button.

⟨DATA⟩ is an example of a hardware key (hard key) that you must press on the GeoExplorer 3 keypad.

Warnings, Cautions, Notes, and Tips

Warnings, cautions, notes, and tips draw attention to important information and indicate its nature and purpose.

WARNING Warnings alert you to situations that could cause personal injury or unrecoverable data loss.

CAUTION Cautions alert you to situations that could cause hardware damage or software error.

NOTE Notes give additional significant information about the subject to increase your knowledge, or guide your actions.

TIP Tips indicate a shortcut or other time- or labor-saving hint that can help you make better use of the product.

System Overview

1 SYSTEM OVERVIEW

This System Overview provides general information about the GeoExplorer 3® data collection system, its components, and accessories. System Overview is divided into two sections. The Introduction explains what the GeoExplorer 3 is and provides an overview of what you can do with it. Components and Accessories outlines the parts and software that make up the GeoExplorer 3 data collection system.

- Introduction, page 2-1
- Components & Accessories, page 3-1

2   Introduction

This section introduces you to the GeoExplorer 3 data collection system. The topics covered include:

- What is the GeoExplorer 3 Data Collection System?, page 2-2
- What Can You Do with the GeoExplorer 3 Data Collection System?, page 2-3
- GeoExplorer 3c Edition, page 2-5
- Using the GeoExplorer 3 Data Collection System, page 2-6

2.1   What is the GeoExplorer 3 Data Collection System?

The GeoExplorer 3 data collection system is an integrated GPS receiver and data collector for mapping, relocating, and updating GIS and spatial data. It can be used with a real-time source of differential corrections such as Trimble's Beacon-on-a-Belt (BoB™) receiver. It also works with the GPS Pathfinder® Office software for mission planning, data transfer, data dictionary creation, data import/export, and postprocessing.

You can operate the GeoExplorer 3 data collection system as a rover (see Glossary-16) receiver or as a base station (see Glossary-3). You can also collect high-precision data using GPS carrier phase measurements. Using the intuitive user interface you can navigate, collect data, view system status and satellite availability, and control the GPS receiver.

The GeoExplorer 3 datalogger is designed for handheld use in the field. It has an internal antenna and power source, and a high-performance 12-channel GPS receiver. Optional accessories, such as external antennas or power kits, are also available.

2.2   What Can You Do with the GeoExplorer 3 Data Collection System?

The primary functions of the GeoExplorer 3 data collection system are collecting geographic data, using and updating existing GIS data, and navigating in the field.

Use the GeoExplorer 3 to accurately and efficiently collect the attributes and GPS position of geographic points, lines, and areas. This information is stored in one or more data files that you can transfer to Trimble's GPS Pathfinder Office software for postprocessing (see Glossary-15) and editing. Data can then be exported into a wide range of GIS-compatible formats.

Use the GeoExplorer 3 to update data from an existing GIS or CAD database. You can also review, edit, and update the GPS positions and attributes for features.

Use one of three methods of navigation—a road view, compass, or chart—to navigate to specific locations. You can use real-time differential GPS (see Glossary-16) to optimize navigation and provide in-field differential accuracy.

It is easy to create or edit data dictionaries and setup configurations in the office with the GPS Pathfinder Office software. Alternatively, use the GeoExplorer 3 data collection system to create or edit data dictionaries.

The GeoExplorer 3 data collection system provides two maps for use in the field:

- The Chart to create waypoints and to navigate to features and waypoints
- The Map to view and update features

For greater precision, use real-time DGPS to differentially correct positions as you collect data in the field. The GeoExplorer 3 data collection system is compatible with the Beacon-on-a-Belt (BoB) receiver to provide real-time DGPS, as well as other DGPS providers. To compute positions with even greater accuracy, using the GPS Pathfinder Office software, collect carrier phase data for points, lines, and areas.

You can operate the GeoExplorer 3 data collection system as a temporary GPS base station in situations where it is impossible or impractical to set up a permanent base station.

Applications for the GeoExplorer 3 include forestry mapping, environmental and resource management, disaster assessment, utility inventories, and urban asset management. For example, a power company could build an asset register of all its power poles, record their positions, their condition and structure, and any attached hardware. A maintenance crew can then use the GeoExplorer 3 navigation functions to locate poles that need repair.

2.3   GeoExplorer 3c Edition

This manual describes the GeoExplorer 3 data collection system.

If you have purchased the GeoExplorer 3c data collection system edition, the following functionality is not available with your system:

- Map or Chart tabs
- Cable-free communication with the BoB receiver
- Transfer of Trimble SSF data files to the GeoExplorer 3 data collection system
- Transfer of coordinate systems from the GPS Pathfinder Office software

You can upgrade your GeoExplorer 3c edition to the full GeoExplorer 3 data collection system. To do this, contact your local Trimble dealer.

Introduction

2.4 Using the GeoExplorer 3 Data Collection System

The GeoExplorer 3 firmware is arranged in three sections. They are:

- THE SYS SECTION, page 16-1
- THE DATA SECTION, page 20-1
- THE NAV SECTION, page 25-1

General Operation (see page 15-1) explains the structure of the three sections and how to use the keys and screens.

Alternatively, refer to your QuickStart (see page 3-14) quick reference card.

3 Components & Accessories

The GeoExplorer 3 data collection system has the following components:

- The GeoExplorer 3 Handheld Data Collector, page 3-10
- GeoExplorer 3 Support Module, page 3-11
- GPS Pathfinder Office Software, page 3-12
- GeoExplorer 3 Operation Guide CD, page 3-13
- QuickStart, page 3-14
- Standard Accessories, page 3-15

  - Data Collector Pouch, page 3-16
  - Serial Clip, page 3-18

  - Lanyard, page 3-17
  - Null Modem Cable, page 3-19

The GeoExplorer 3 data collection system also contains the following optional accessories:

- Beacon-on-a-Belt (BoB) Receiver, page 3-21
- External Antenna Option, page 3-27

- GeoExplorer 3 External Power Kit, page 3-22

Before you unpack the components and accessories, see Inspecting the System, page 3-2.

Components and Accessories

3.1   Inspecting the System

When you receive your GeoExplorer 3 data collection system, inspect all contents for visible damage (scratches, dents) and if any instruments appear damaged, notify the carrier. Keep the shipping and packaging material for the carrier's inspection.

You will need to provide a part number to return a component to Trimble. Extra components can be also be ordered.

All components and part numbers are listed in this manual, along with instructions for returning goods to Trimble.

If you have purchased the …	see …
GeoExplorer 3 data collection system	GeoExplorer 3 Full Equipment List, page 3-3
GeoExplorer 3 external power kit	GeoExplorer 3 External Power Kit, page 3-5
GeoExplorer 3 external antenna kit	GeoExplorer 3 External Antenna Kit, page 3-6
Beacon-on-a-Belt system	Beacon-on-a-Belt (BoB) Receiver Equipment List, page 3-7
Beacon-on-a-Belt (BoB) external power kit	Beacon-on-a-Belt (BoB) Receiver External Power Kit, page 3-9

3.1.1   GeoExplorer 3 Full Equipment List

The following table lists the product name and Trimble part number for each item included with the GeoExplorer 3 data collection system. This information is useful for ordering spare or replacement parts:

Equipment description	Part Number
GeoExplorer 3 data collection system	39100-00-ENG
GeoExplorer 3 data collector	38376-00
GeoExplorer 3 data collector pouch	38599
Null modem cable	18532
GeoExplorer 3 data collector lanyard	36996
GeoExplorer 3 serial clip	38595-00
GeoExplorer 3 support module	38604-00
GeoExplorer 3 QuickStart	38598-00-ENG
GeoExplorer 3 Operation Guide CD	38596-20-ENG
GeoExplorer 3 Release Notes	38597-20-ENG
Warranty Activation Card	25110-00
Wall power cable	39180
Power supply	38874
GPS Pathfinder Office software system	34191-28-ENG
Mapping Systems General Reference	24177-01

Components and Accessories

Components and
Accessories

GPS Pathfinder Office v2.80 software CD	34191-28
GPS Pathfinder Office v2.80 Release Notes	34195-28-ENG
GPS Pathfinder Office v2.80 Getting Started Guide	34231-28-ENG
GPS Pathfinder Office manual set (optional)	34192-28-ENG
GeoExplorer 3 RTCM/NMEA splitter cable (optional)	39142
GeoExplorer 3 hard carrying case (optional)	39292-00
GeoExplorer 3 Operation Guide (optional printed manual)	39628-20-ENG

3.1.2 GeoExplorer 3c Edition Equipment List

Equipment description	Part Number
GeoExplorer 3c data collection system	39100-50-ENG
(this is the same as the GeoExplorer 3 data collection system but with different firmware)	

3.1.3   GeoExplorer 3 External Power Kit

The following table lists the product name and Trimble part number for each item included with the GeoExplorer 3 external power kit. This information is useful for ordering spare or replacement parts:

Equipment description	Part Number
GeoExplorer 3 External Power Kit	39001-00
Shoulder carrying pouch	21754-10
12 V camcorder battery	17466
Null modem cable	18532
External power splitter cable	39183
Vehicle adaptor power cable	39182
Camcorder adaptor power cable	39181
Camcorder charger	39184
Camcorder charger cable	11017

Components and Accessories

3.1.4 GeoExplorer 3 External Antenna Kit

The following table lists the product name and Trimble part number of the GeoExplorer 3 external antenna kit. This information is useful for ordering spare or replacement parts:

Equipment description	Part Number
GeoExplorer 3 External Antenna Kit	39002-00

3.1.5   Beacon-on-a-Belt (BoB) Receiver Equipment List

The following table lists the product name and Trimble part number for each item included with the Beacon-on-a-Belt (BoB) system in the United States (customers outside the United States should refer to the table on the following page). This information is useful for ordering spare or replacement parts:

Equipment description	Part Number (United States only)
Beacon-on-a-Belt (BoB) system	38600-00-ENG
BoB receiver	38508-00
BoB receiver pouch	38603
Wall power cable	38874
Power supply	39180
Warranty Activation Card	25110-00
PC-BoB software	38601-00
BoB Receiver Manual	38602-00-ENG
Null modem cable	43377

Components and Accessories

The following table lists the product name and Trimble part number for each item included with the Beacon-on-a-Belt (BoB) system for customers **outside the United States**. This information is useful for ordering spare or replacement parts:

Equipment description	Part Number (outside the United States)
Beacon-on-a-Belt (BoB) system	38600-10-ENG
BoB receiver	38508-10
BoB receiver pouch	38603
Wall power cable	38874
Power supply	39180
Warranty Activation Card	25110-00
PC-BoB software	38601-00
BoB Receiver Manual	38602-00-ENG
Null modem cable	43377

3.1.6   Beacon-on-a-Belt (BoB) Receiver External Power Kit

The following table lists the product name and Trimble part number for each item included with the Beacon-on-a-Belt (BoB) external power kit. This information is useful for ordering spare or replacement parts:

Equipment description	Part Number
Beacon-on-a-Belt (BoB) External power kit	39003-00
12 V Camcorder battery	17466
Camcorder adaptor cable	39181
Vehicle adaptor cable	39182
12 V Camcorder charger	39184
Wall power cable	38874
Vehicle splitter cable	21756

Components and Accessories

Components and Accessories

3.2   The GeoExplorer 3 Handheld Data Collector

The GeoExplorer 3 handheld data collector is a high performance 12-channel GPS receiver. It is a battery-powered unit designed for use in the field. With the GeoExplorer 3 you can navigate to points of interest and also store up to 1 MB of position and attribute information for point, line, and area features.

3.2.1   Maintenance and Care of Your GeoExplorer 3

To maintain and care for your GeoExplorer 3 handheld data collector:

- keep the outer surface free of dirt and dust
- keep the connectors free of dirt and dust
- recharge the internal battery when required

3.3   GeoExplorer 3 Support Module

The GeoExplorer 3 support module is used to transfer data between the GeoExplorer 3 and the PC software and also charge the internal battery.

You can put the GeoExplorer 3 handheld into the GeoExplorer 3 support module when the GeoExplorer 3 is on or off. When powered, the GeoExplorer 3 support module automatically detects that the GeoExplorer 3 is present and, if it is off, puts it in Standby mode.
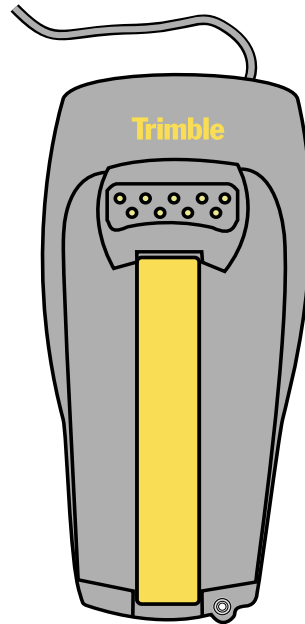
NOTE   For pinout details, see SPECIFICATIONS,

Components and
Accessories

3.4   GPS Pathfinder Office Software

The GPS Pathfinder Office software runs under Microsoft Windows 95, Windows 98, Windows 2000, Windows ME, or Windows NT. It provides all the tools you need to manage a data collection project, handling data from the entire range of Mapping and GIS data collection systems that use Trimble GPS receivers.

The GPS Pathfinder Office software lets you:

- plan the best times to collect GPS positions, using the powerful Quick Plan Mission Planning utility.
- create separate projects to help you manage the data associated with these projects effectively and conveniently.
- construct and edit data dictionaries, which can be used to control the data collection operation and which make sure that the collected data is complete, accurate, and compatible with your GIS, CAD package, or database.
- transfer files to and from GPS receivers and handheld data collectors.
- process the GPS positional data to improve its accuracy.
- display and edit collected data in the office, optionally overlaying this data onto a vector or raster background map.
- export the collected, processed, and edited data to a GIS, CAD, or database format.
- produce a scaled plot as a paper record of the data.
- set up configurations for your GeoExplorer 3 data collector.

The GeoExplorer 3 data collection system uses the GPS Pathfinder Office software to make best use of the data collected in the field. The GPS Pathfinder Office software is used to transfer GPS data to a PC, and then differentially correct, view, and edit the data. The GPS Pathfinder Office software also exports the data in a format suitable for your GIS or CAD system.

3.5   GeoExplorer 3 Operation Guide CD

The standard GeoExplorer 3 data collection system includes the GeoExplorer 3 Operation Guide CD.

The CD is designed to provide you with hands-on learning that is easy and informative.

It contains:

- an interactive tutorial
- a documentation tutorial
- a GeoExplorer 3 reference guide detailing every system function

Components and Accessories
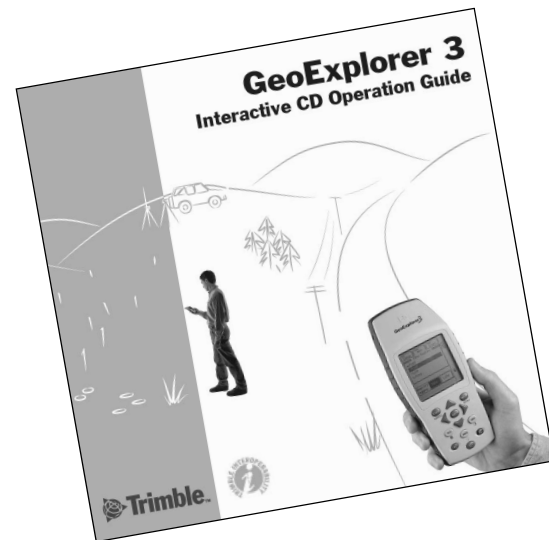
3.6 QuickStart

The GeoExplorer 3 QuickStart quick reference card is designed to be taken into the field.

It contains information about:

- the GeoExplorer 3 handheld
- the menu structure
- status bar icons
- satellite information
- basic troubleshooting
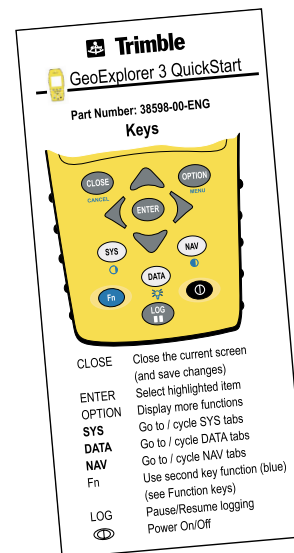
3.7   Standard Accessories

The following sections describe the standard accessories provided as part of your GeoExplorer 3 data collection system.

- Data Collector Pouch, page 3-16

- Lanyard, page 3-17

- Serial Clip, page 3-18

- Null Modem Cable, page 3-19

3.7.1 Data Collector Pouch

The data collector pouch is provided to protect your GeoExplorer 3 handheld data collector and enable you to store and transport it easily. The data collector pouch fits ergonomically onto your belt as shown:

3.7.2   Lanyard

The lanyard can be attached to your GeoExplorer 3 data collector or to the data collector pouch to make it easier to carry. Connect the lanyard to the GeoExplorer 3 as shown:
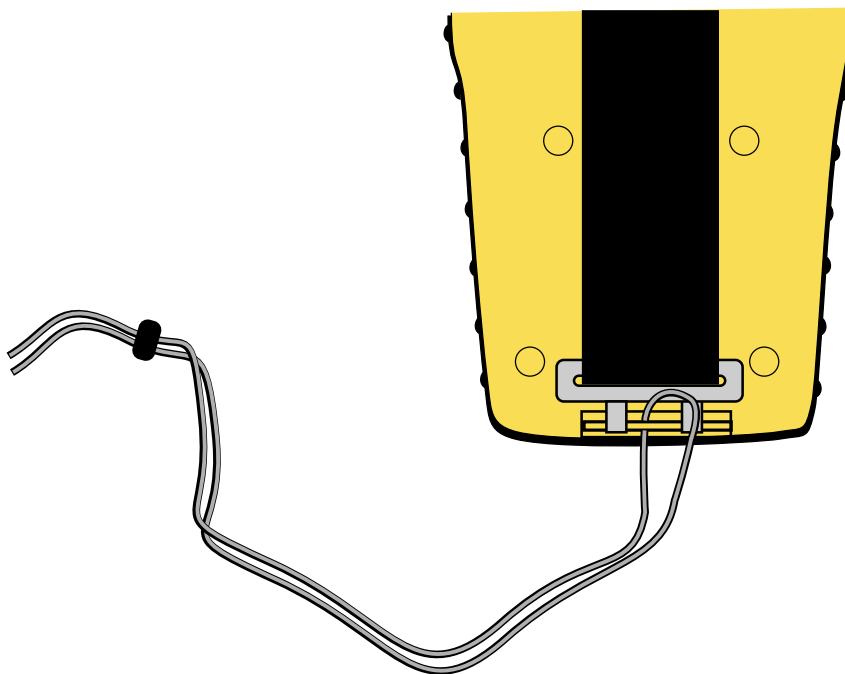
3.7.3   Serial Clip

The serial clip is attached to the swipes on the rear of the GeoExplorer 3 data collector to let you connect to an RTCM (see Glossary-16) device to receive real-time corrections, or to connect to a device that receives NMEA (see Glossary-14) data.

If you do not have a GeoExplorer 3 support module available, you can also use the serial clip to connect to either your office computer to transfer data, or an external power source.
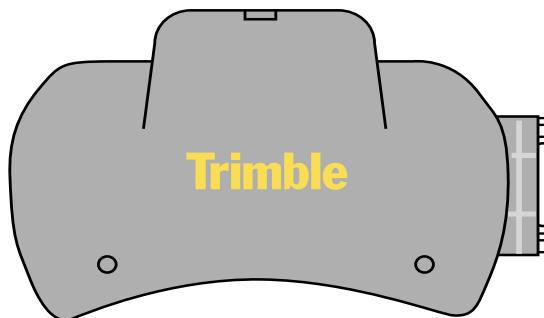
NOTE   For pinout details, see GeoExplorer 3 Serial Clip, page 29-2.

3.7.4   Null Modem Cable

The supplied DB-9 null modem cable is used to connect the GeoExplorer 3 support module to the office computer.

The null modem cable can also be used to connect the GeoExplorer 3 data collector to the office computer using the serial clip, and to connect to the BoB receiver, where the cable-free transmission is either not enabled, or not possible due to interference.
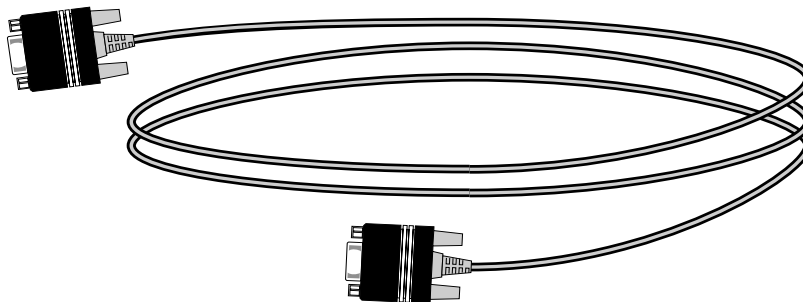
3.8   GeoExplorer 3 Optional Accessories

The optional accessories for the GeoExplorer 3 data collection system are:

- Beacon-on-a-Belt (BoB) Receiver, page 3-21
- GeoExplorer 3 External Power Kit, page 3-22
- External Antenna Option, page 3-27 (vehicle and range pole mount)

3.8.1   Beacon-on-a-Belt (BoB) Receiver

The BoB receiver is a belt-mounted MSK receiver capable of receiving differential corrections from DGPS radiobeacons using the RTCM (see Glossary-16) SC-104 standard format. The BoB receiver retransmits this data both on a low power cable-free link and on a standard RS-232 connection.

Configure the BoB receiver using the PC-BoB software for the BoB receiver.

Components and Accessories
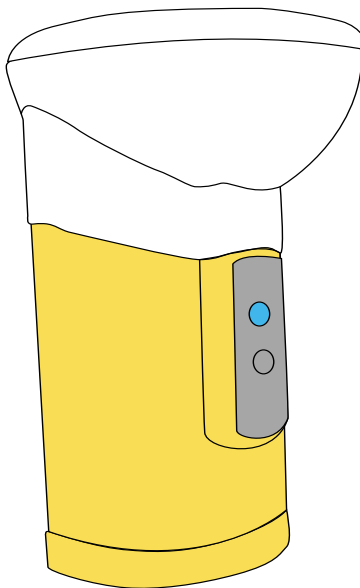
3.8.2   GeoExplorer 3 External Power Kit

The standard GeoExplorer 3 data collection system comes with a factory-installed Lithium-ion battery. This will provide power for the GeoExplorer 3 for up to 10 hours before needing to be recharged (less if the backlight is used). For additional battery life you can purchase the external power kit. This lets you power the GeoExplorer 3 receiver from a rechargeable 12 V camcorder battery, or from a vehicle. The kit includes:

- Shoulder Carrying Pouch, page 3-23
- 12 V Camcorder Battery and Charger, page 3-24
- Vehicle Power Adaptor Cable, page 3-24
- Camcorder Power Adaptor Cable, page 3-25
- Power/Data Splitter Cable, page 3-26

Shoulder Carrying Pouch

The shoulder carrying pouch can accommodate the GeoExplorer 3 handheld data collector, a 12 V camcorder battery, and cable accessories:
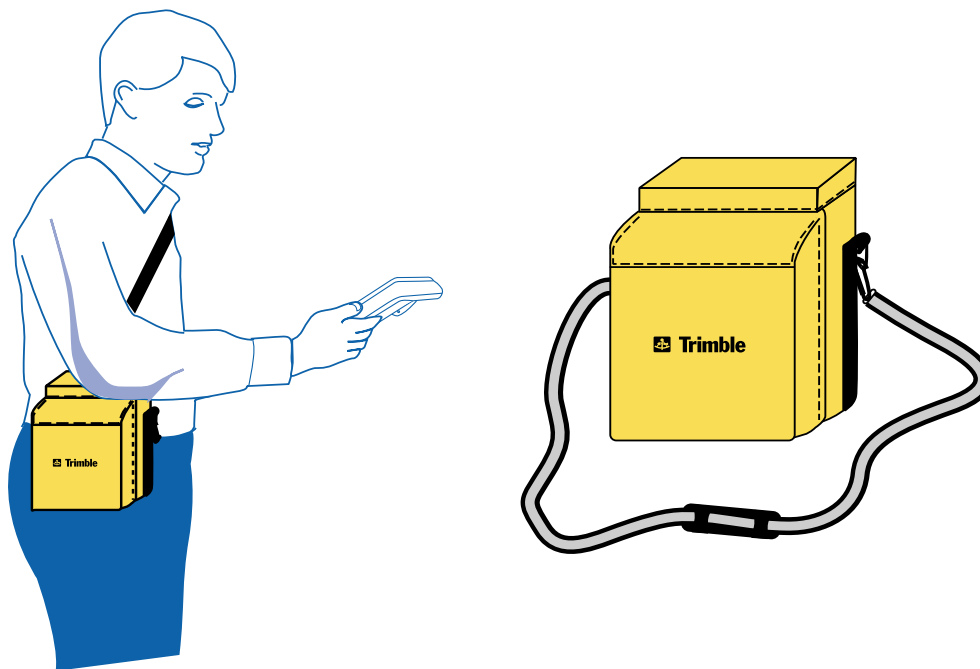
12 V Camcorder Battery and Charger

The rechargeable 12 V camcorder battery provides 20 hours of continuous GeoExplorer 3 operation, and can be fully recharged overnight.

Vehicle Power Adaptor Cable

The vehicle power adaptor cable connects the power/data splitter cable or the support module to a vehicle's cigarette-lighter socket.
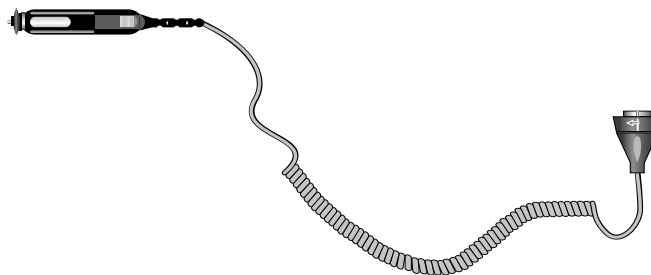
Camcorder Power Adaptor Cable

The camcorder power adaptor cable connects the power/data splitter cable or the support module to the camcorder battery.
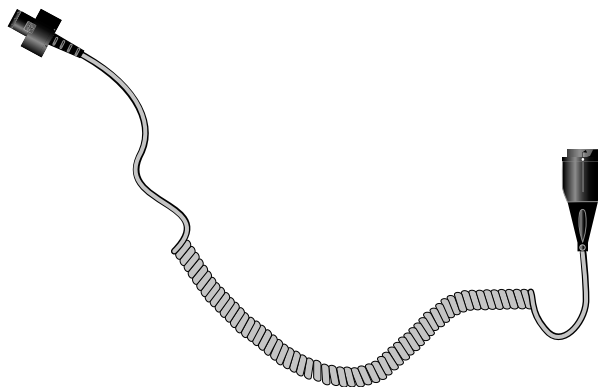
Power/Data Splitter Cable

The power/data splitter cable allows external power to be received through the serial clip while also allowing a serial connection to the GeoExplorer 3 receiver.

To other device

To serial clip

To vehicle or
camcorder adaptor
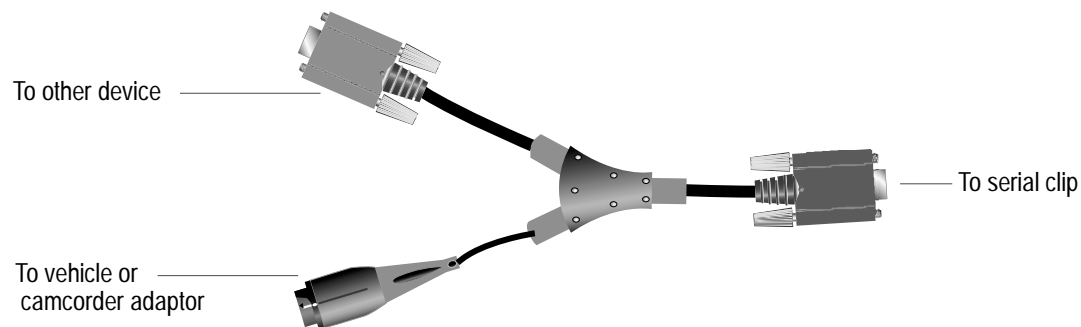
3.8.3   External Antenna Option

In situations where the internal antenna's view of the sky is blocked (for example, in a vehicle), or in multipath conditions, an optional external antenna kit is available. The external antenna kit contains an antenna with a magnetic base and a pole-mountable ground plane. Poles are purchased separately.

SLIDE
ANTENNA
TO REMOVE

Trimble
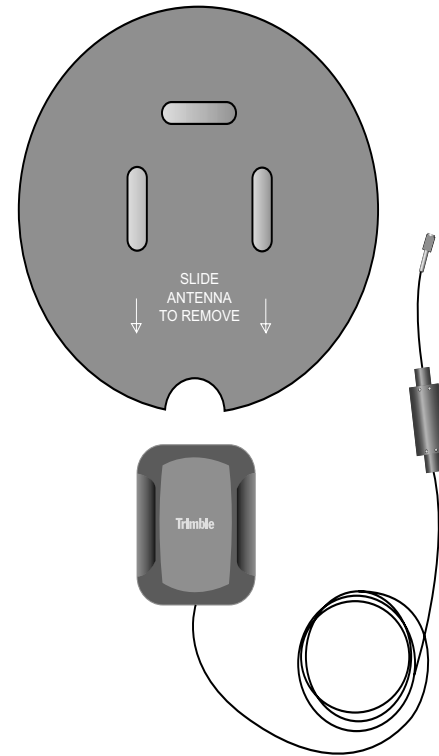
Tutorial

4 TUTORIAL

The Tutorial provides step-by-step instructions for some of the tasks that you will perform when using the GeoExplorer 3 data collection system. Two of the primary functions of the GeoExplorer 3 are data collection and data update. Of the five parts to the tutorial, three relate to data collection and two to real-time data update. They are:

Data Collection

- In the Office, page 5-1

- In the Field, page 6-1

- Processing the Data, page 7-1

Data Update

- Preparing for Update, page 8-1

- Back in the Field, page 9-1

NOTE It is important that you read the Introduction (see page 2-1) before you proceed with this tutorial. You need to know about the menu structure of the GeoExplorer 3 data collection system and how to use the keypad on the GeoExplorer 3 handheld.

Tutorial

To help you master the main concepts and tasks involved, the tutorial is based on the following scenario:

The Waterstone National Park requires an inventory of its assets and resources. These include gates, roads, signs, campgrounds and their amenities, water faucets, lakes, and other resources in the park. Information needs to be collected about each entity, indicating its condition and other specific information. As a Park Ranger, you and your field crew are responsible for collecting new data, as well as updating the existing GIS data.

Data collection: In this part of the tutorial you create a project for Waterstone Park. Then you create a data dictionary, or list of features, using the GPS Pathfinder Office software. When the data dictionary is transferred to the GeoExplorer 3 data collection system, you go out to the park and use it to record features and attributes. Back in the office, you postprocess the data to achieve better results and export the data to the Waterstone National Park GIS.

Data update: In this part of the tutorial you update existing GIS data using the GeoExplorer 3 data collection system. Before going back to the park you transfer existing data to the GeoExplorer 3 and prepare for an update session. In the field, you use the GeoExplorer 3 data collection system and the Beacon-on-a-Belt (BoB) real-time differential GPS (see Glossary-16) source to navigate back to features and then update the attributes.

5 In the Office

Before going to Waterstone Park to collect data, you need to create a project and a data dictionary. When the data dictionary is complete, transfer it to the GeoExplorer 3 data collection system.

Preparing for collection provides step-by-step instructions to help you prepare to go out to the field and collect data. Topics are:

- Creating a Project, page 5-2
- Creating a Data Dictionary Using the GPS Pathfinder Office Software, page 5-3
- Data Transfer, page 5-26
- Checking the Equipment, page 5-28

5.1   Creating a Project

The GPS Pathfinder Office software is a powerful, Windows-based tool for processing and managing GPS data. GPS Pathfinder Office lets you easily plan your data collection session and process the GPS data successfully.

Use the GPS Pathfinder Office software to organize work into projects. Dividing the work in this way helps you manage files. You can give all projects meaningful names, and assign separate folders for base, export, and backup files.

You can also set up projects for different groups of data. For example, you could create a project for each major monitoring task, as well as for each region of the park, or for each month.

For this tutorial, create a project named `Geo3 Tutorial`.

For more information, refer to the GPS Pathfinder Office Help.

5.2   Creating a Data Dictionary Using the GPS Pathfinder Office Software

A data dictionary contains a description of the features and attributes relevant to a particular project or job. It is used in the field to control the collection of a feature (see Glossary-8) and its attributes (see Glossary-2).

Understanding how to put together a data dictionary is very important. Design a data dictionary with your Geographic Information System (GIS) in mind. In particular, be familiar with any format restrictions imposed by the GIS, otherwise you may not be able to import the data you collect.

The Waterstone National Park already has a GIS. You need to create a data dictionary to collect new data, and update existing data, for import to the GIS.

The different park components that you need to map are **features**. These include gates, roads, water faucets, and lakes. The different types of information that you record for each type of feature are **attributes**. For example, the name of a road, or the condition of a gate, are attributes.

In this part of the tutorial the following tasks are explained:

Preparing for Collection

Starting a Data Dictionary

1. To start the Data Dictionary Editor in the GPS Pathfinder Office software, select Utilities / Data Dictionary Editor.

2. In the Name field, type **Waterstone**. This is the title of the data dictionary that appears on the GeoExplorer 3 handheld.

3. In the Comment field, type your name. This is optional, but a good reference. The dialog box looks similar to the following:
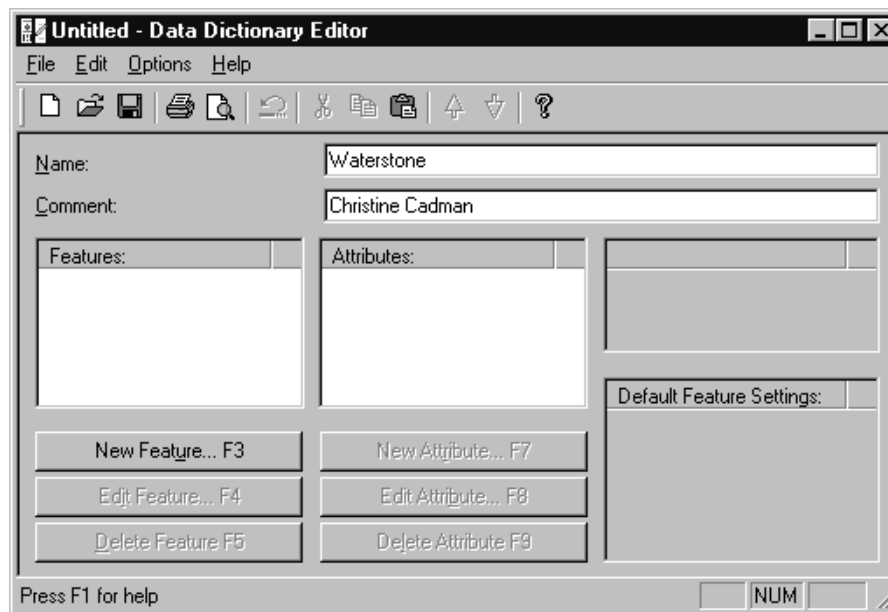
Creating a point feature

The first type of feature you are going to create is a gate. It will be used to do an inventory of where all the gates are and what condition they are in.

To create a point feature:

1. Click **New Feature**. Make sure that the Properties tab is selected.

2. In the Feature Name field, type **Gate**.

   This is the name that appears on the GeoExplorer 3 handheld when you use this data dictionary in the field.

3. In the Feature Classification group, the Point option is the default. A gate is at a single location on the earth's surface, so a point is the most appropriate classification for this feature. Leave this setting as is.

4. Click **OK**.

   The Data Dictionary Editor screen displays "Gate" in the list of features. A symbol indicates that it is a point feature.
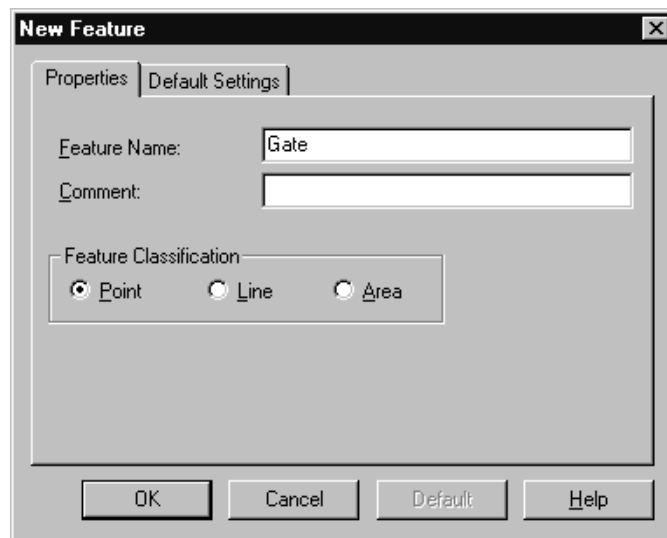
First create the gate point feature and then add the attributes. There are two attributes for the gate feature: Condition (menu attribute) and Lock ID (numeric attribute).

- Creating a menu attribute, page 5-8
- Creating a numeric attribute, page 5-12

Preparing for Collection

Creating a menu attribute

Menu attributes are useful when the information you need to store is a defined set of options. This standardizes the entry of information and makes it quicker to enter values in the field and to search for features in the GPS Pathfinder Office software.

The first attribute of the gate is Condition. The only values for this attribute are good, repair, or repaint, so making this a menu attribute is appropriate. In the field, a menu with these three values appears when you are entering the Condition attribute.

To create a menu attribute:

1.   Click **New Attribute**. The following dialog appears:
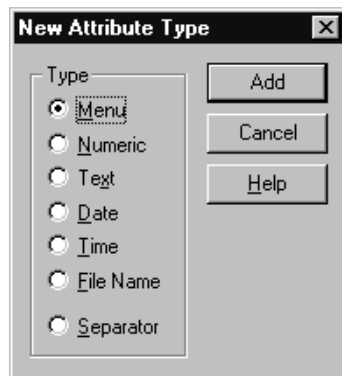
2.   Select the Menu option and click **Add**.

The New Menu Attribute dialog appears.

3.   You need to know the condition of the gates, so in the Attribute Name field, type **Condition**:
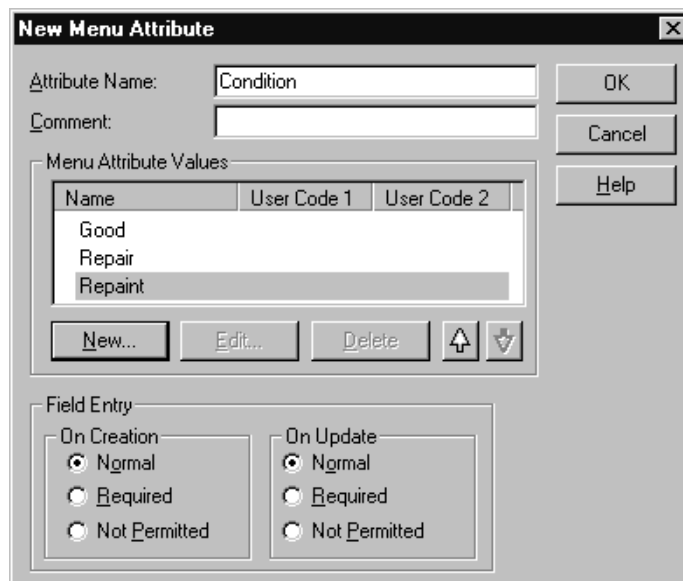
4.   Click **New**. The New Attribute Value – Menu Item dialog appears.

5. In the Attribute Value field, type **Good**. Click **Add**.
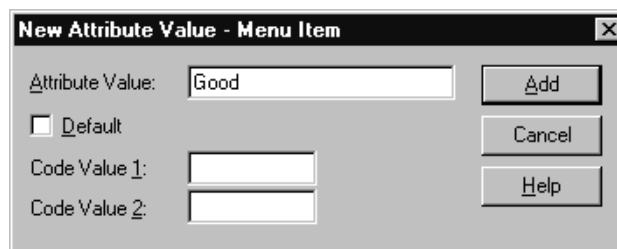
6. In the Attribute Value field type **Repair**. Click **Add**.
7. In the Attribute Value field type **Repaint**. Click **Add.**

8.   Click **Close** to return to the New Menu Attribute dialog. It displays the new attribute values:

9.   Click **OK** to create this attribute. Then click **Close** to close the New Attribute Type dialog.

Creating a numeric attribute

Use a numeric attribute type to enter numeric values in fields. The minimum and maximum values help eliminate incorrect entries, and a sensible default value can save time.

The next attribute you need to create for the gate is Lock ID. A lock ID number identifies which key corresponds to which lock in the park. It is recorded as a number between 1 and 200.

NOTE Before creating this numeric attribute, make sure the Numeric Default Values Required command is turned off. This is necessary if you are to create numeric attributes without default values. To turn off this command, select Options / Numeric Default Values Required. There must be *no* check mark beside the command. For more information, refer to the GPS Pathfinder Office Help.

To create a numeric attribute:

1.   In the New Attribute Type dialog, select the Numeric option and click **Add**.

2.   In the Attribute Name field, type `Lock ID`.

3.   In the Decimal Places field, the default is 0. *Do not* change this default value, as the lock ID numbers do not have any decimal places.

4. In the Minimum field type **1** and in the Maximum field type **200**, as all lock ID numbers are between 1 and 200. This limits the range of values that you can enter:

5. Click **OK** to create this attribute.

6. Click **Close** to close the New Attribute Type dialog. The attributes you created now appear in the attribute field.

NOTE   When you are in the field, if you enter a value outside the minimum/maximum range, an error message appears on the screen of the GeoExplorer 3 handheld.

New Numeric Attribute

Attribute Name:	Lock ID
Comment:	
Decimal Places:	0
Minimum:	1
Maximum:	200
Default:	

OK

Cancel

Help

Field Entry

On Creation
- ⊙ Normal
- ○ Required
- ○ Not Permitted

On Update
- ⊙ Normal
- ○ Required
- ○ Not Permitted

Auto-Incrementing
- ⊙ No Increment
- ○ Increment
  - Step Value: 1   ⊙ + ○ –

Preparing for Collection

Creating a line feature

You need to map the roads in the park, so create a line feature.

To create a line feature:

1.   Click **New Feature**.

       The New Feature dialog appears.

2.   In the Feature Name field, type `Road`.

3.   In the Feature Classification group, select Line.

4.   Select the Default Settings tab to view the logging interval for this feature.

       The logging interval is the time between feature GPS positions. The default logging interval for line features is 5 seconds. This means that when you start logging a line feature, the GeoExplorer 3 logs one GPS position every five seconds, until you end the feature logging. Change the logging interval to 1 second for the Road feature. An increased logging rate makes sure that more data is collected and a more detailed map of the roads is provided.

5.   Use the Logging Interval list boxes to change the logging interval to 1 second:
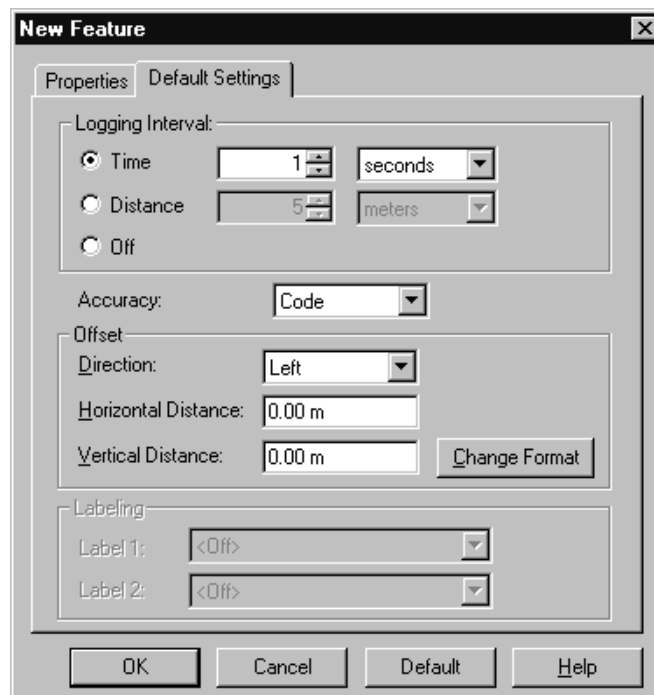
6.   Click **OK** to create this feature.

NOTE   When you are in the field, you can also use the GeoExplorer 3 data collection system to edit the
logging interval in Feature Settings (see page 19-60).

Now that you have created the road line feature, add the attributes. There are two attributes for this feature: Road Name (text attribute) and Speed Limit (menu attribute).

- Creating a text attribute, page 5-17
- Creating a menu attribute with a default value, page 5-19

Preparing for Collection

Creating a text attribute

Text attributes are useful when the information to be stored varies for different occurrences of a feature and when a defined menu list is impractical. For this tutorial you want to record the name of each road. There are too many road names to make a menu, so a text attribute is appropriate. It lets you enter letters, numbers, and punctuation, for each road name. To make sure that the road name is entered, set the attribute as required. This means that, in the field, a name must be entered before the road feature can be saved.

To create a required text attribute:

1.   Click **New Attribute**.

      The New Attribute Type dialog appears.

2.   In the Type field, select Text and click **Add**.

3.   In the Attribute Name field, type `Name`.

4.   The Length field determines the number of characters that can be entered for the attribute. By default, the length of a text attribute is 30 characters. You can change this, but for this tutorial leave as is.

Preparing for
Collection

5.   In the On Creation group, select the Required option. This means that the field crew must enter a value for the Name attribute:

New Text Attribute

Attribute Name: Name   OK

Comment: Cancel

Length: 30   Help

Default:

Field Entry
  On Creation   On Update
  ○ Normal   ● Normal
  ● Required   ○ Required
  ○ Not Permitted   ○ Not Permitted

Auto-Incrementing
  ● No Increment
  ○ Increment
      Step Value: 1   ● + ○ -

6.   Click **OK** to create this attribute.

Creating a menu attribute with a default value

The next attribute for the road is Speed Limit. You want to record the speed limit for each of the roads. The values are defined numbers within a certain range, so a menu attribute is appropriate. Most of the roads in Waterstone Park have a speed limit of 10 mph, so make 10 the default value. This saves time in the field, as the speed limit attribute needs to be entered only if it is not 10 mph.

To create a menu attribute with a default value:

1.   In the New Attribute Type dialog, select the Menu option and click **Add**.

     The New Menu Attribute dialog appears.

2.   In the Attribute Name field, type **Speed Limit**.

3.   Click **New**.

     The New Attribute Value – Menu Item dialog appears.

4.   In the Attribute Value field, type **5** and click **Add**.

5.   In the Attribute Value field, type **10** and set this value as the default. To do this, select the Default check box and click **Add**.
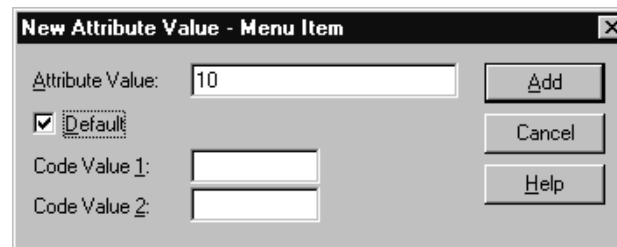
6.   In the Attribute Value field type **15** and click **Add**. Repeat for **20** and **25**.

7. When you have entered all the values, click **Close** to return to the New Menu Attribute dialog. It now displays the attribute values you created. An * symbol appears in front of 10 to show that it is the default.

8. Click **OK** to create this attribute.

9. Click **Close** to close the New Attribute dialog.

Creating a point feature with a date attribute

The next feature to create is a water faucet. Use this point feature to record the location of water faucets in the park. Create the Water Faucet feature in the same way that you created the Gate feature. For more information, see Creating a point feature, page 5-6.

There are three attributes for the Water Faucet feature: ID Number (numeric attribute), Test Tube Number (numeric attribute), and Date (date attribute).

Preparing for
Collection

Creating the numeric attributes

All water faucets in the park are labeled with an identification number. You will record this number when collecting data.

Create the ID Number attribute in the same way that you created the Lock ID attribute. Use the following values:

Monthly water samples are collected from the water faucets in the park to make sure water is safe for drinking. The samples are collected in pre-numbered test tubes. This test tube number is recorded in the GeoExplorer 3 so that results from the lab can be correctly entered into the GIS.

Create the Test Tube Number attribute the same way you created the Lock ID attribute. Use the following values:

For more information, see Creating a numeric attribute, page 5-12.

Creating a date attribute

The last attribute for the Water Faucet feature is the date visited. You can create this attribute so that it is automatically generated for each faucet. When a water faucet feature is collected, the current date is automatically entered as the Date attribute.

To create a Date attribute:

1. In the New Attribute Type dialog select the Date option and click **OK**.

2. In the Attribute Name field, type **Date**.

3. By default, the Auto Generate on Creation check box is selected. Select the Auto Generate on Update check box, as well.
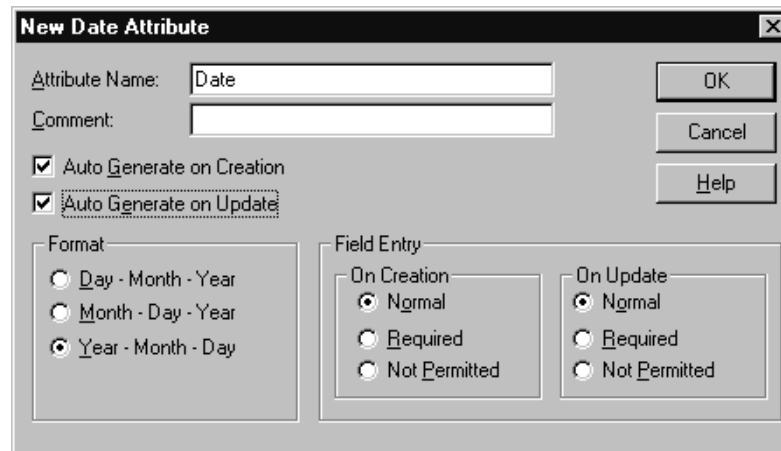
When you create a new water faucet feature or update an existing one, the GeoExplorer 3 automatically generates the date

4. Click **OK** to create this attribute, then click **Close** to close the New Attribute Type dialog.

Creating an area feature

You need to map the lakes in Waterstone Park, so create an area feature. You do not need to record any information about the lake, so you do not need attributes for this feature. Create the Lake feature in the same way that you created the Gate feature, but this time in the New Feature dialog select Area in the Feature Classification group.

For more information, see Creating a point feature, page 5-6.

Saving the data dictionary

Once you have added all features and their attributes, it is important to save the new data dictionary.

To save the data dictionary:

1. Select File / Save As.

    The Save As dialog appears. By default, the name of the data dictionary is automatically used to generate the file name, for example, C:\Pfdata\Waterstone.ddf.

2. Click **Save**.

3. From the menu bar select File / Exit.

For more information about data dictionaries, refer to the GPS Pathfinder Office Help.

NOTE   Create a data dictionary in the office or in the field. In the field, use the GeoExplorer 3 data collection system to create a new customized data dictionary, or to add features, attributes, and values to an existing data dictionary.

For more information, see Data Dictionaries, page 19-48.

5.3　Data Transfer

You need to transfer the Waterstone data dictionary to the GeoExplorer 3 data collection system, so that you can use it in the field to collect data. Use the Data Transfer utility in the GPS Pathfinder Office software to efficiently transfer data between the GeoExplorer 3 and the office computer.

To transfer the Waterstone data dictionary from the office computer to the GeoExplorer 3 data collection system:

1.　Place the GeoExplorer 3 handheld in the GeoExplorer 3 Support Module (see page 3-11). Make sure that the support module is connected to the office computer.

　　The GeoExplorer 3 is ready to communicate with the GPS Pathfinder Office software. (If communication fails to take place, check the settings in the COMMS, page 19-39 form.)

NOTE　You do not have to turn on the GeoExplorer 3 to transfer data if the support module is powered.

2.　In the GPS Pathfinder Office software, select Utilities / Data Transfer.

　　The Data Transfer dialog appears.

3.　From the Device list, select the device name that represents the GeoExplorer 3 handheld.

　　You can use one of the predefined names (GIS Datalogger on COM 1 or GIS Datalogger on COM 2, depending on which serial (COM) port the support module is connected to) or you can set up a new device definition for your GeoExplorer 3 handheld.

　　The Data Transfer utility automatically connects to the GeoExplorer 3 handheld.

4.　Select the Send tab.

5.　Click **Add and select** Data Dictionary from the list.

The Open dialog appears.

6. Browse until the Waterstone.ddf file appears in the list of files. Highlight it and click **Open**.

    The Open dialog disappears, and the Waterstone data dictionary appears in the Files to Send list:
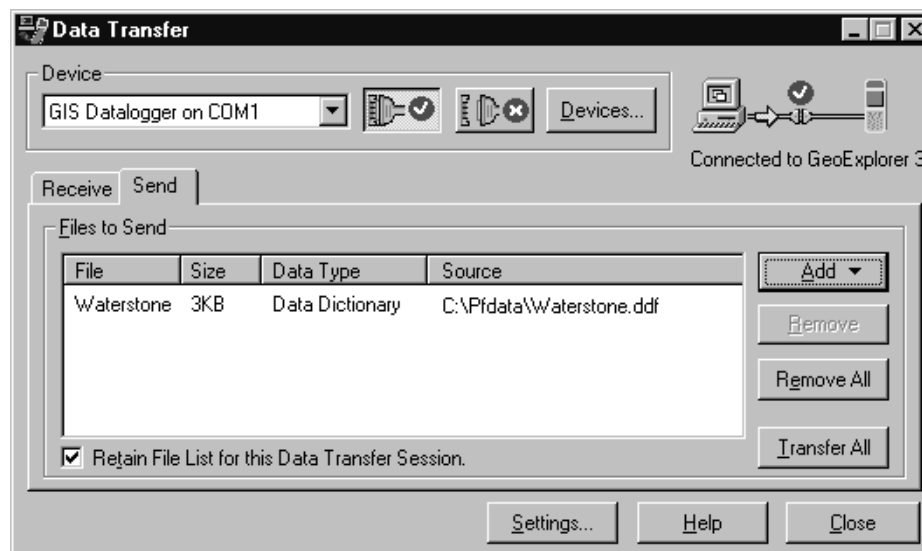
7. Click **Transfer All**.

    The data dictionary is transferred to the GeoExplorer 3 handheld.

8. A message showing summary information about the transfer appears. Click **Close** to close it.

9. To close the Data Transfer utility, click **Close**.

5.4 Checking the Equipment

Before going into the field, check the internal power level to make sure that you have enough power to complete the data collection session. When the GeoExplorer 3 handheld is in the GeoExplorer 3 Support Module (see page 3-11) and turned off, use the Standby screen to check the internal power level.
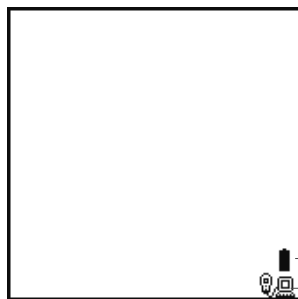
When you turn off the GeoExplorer 3 and put it in the support module, the standby screen appears. Check that the internal power source is fully charged and that data is being transferred. When the level of the internal power is at its highest, the internal power icon appears full (black).

Internal power icon
Data transfer icon

TIP When the GeoExplorer 3 is turned on, use the Status Bar (see page 15-13) to check the level of the internal power. To view the percentage of remaining power use The Status Tab (see page 18-1).

NOTE If the GeoExplorer 3 handheld is still turned on when you put it in the support module, the Standby screen does not appear. The handheld stays on.

6 In the Field

This part of the tutorial uses the data dictionary just created. You are ready to go to Waterstone National Park and collect features. But first there are some tasks that you should complete. Data collection explains these tasks and gives the step-by-step instructions required to collect point, line, and area features, with a variety of different attributes. Topics include:

- Initial Tasks, page 6-2
- Collecting Data, page 6-10
- Closing a File, page 6-24

NOTE Read the Introduction (see page 2-1) before proceeding with this tutorial. You need to know about the main structure of the GeoExplorer 3 data collection system and how to use the keypad on the GeoExplorer 3 handheld.

Data Collection

6.1   Initial Tasks

Before starting a data collection session, complete the following tasks:

- Turning on the GeoExplorer 3 Handheld, page 6-3
- Getting a Clear View of the Sky, page 6-4
- Checking the GPS Status, page 6-5
- Creating a New File, page 6-8

Data Collection

6.1.1 Turning on the GeoExplorer 3 Handheld

When you get to the park, press ⬭ to turn on the GeoExplorer 3 handheld.

When the GeoExplorer 3 is turned on a Trimble identification screen appears for a few seconds while a short self-test is performed.

The GPS tab always appears after the identification screen is displayed.

6.1.2   Getting a Clear View of the Sky
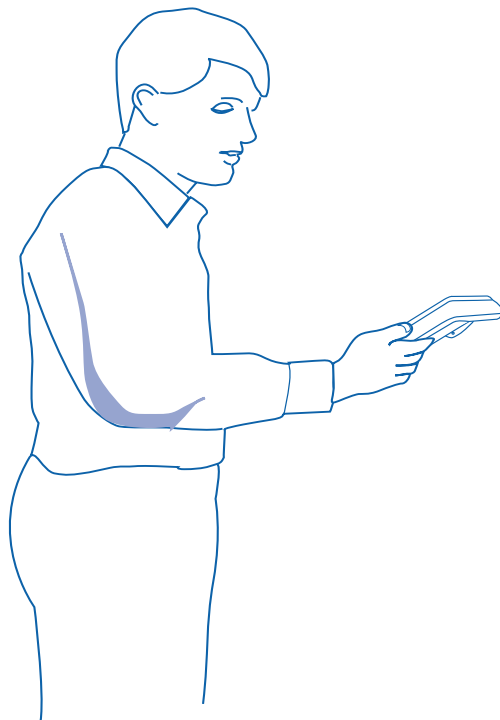
Move to a location where you have a clear view of the sky. Hold the GeoExplorer 3 handheld with the screen towards you. The internal antenna of the GeoExplorer 3 is located above the screen. The receiver does not need to be held perfectly level, but keep the antenna facing upwards, not downwards or sideways.

Signals can be received from any direction but if you cover the antenna the GeoExplorer 3 will no longer track the satellites and will stop computing positions. Satellite signals can be blocked by people, buildings, heavy tree cover, large vehicles, or powerful transmitters. Anything that blocks light also blocks signals. GPS signals can go through leaves, plastic, and glass, but these all weaken the signal.

6.1.3 Checking the GPS Status

When you turn on the GeoExplorer 3 handheld, it automatically begins to track visible satellites and to calculate its current position. Use the satellite icon to check if the GeoExplorer 3 is computing GPS positions. It provides information about the geometry of the satellites that are being used to compute GPS positions. For more information about this icon, see Status Bar, page 15-13.

Use the GPS tab to view the satellites currently tracked and those that are being used to calculate the current position. You can also get an indication of how accurate the GPS positions are.

NOTE   For further explanation of satellite geometry, and how this can affect your GPS data collection, refer to the Mapping Systems General Reference.

Data Collection

To view the GPS screen:

1.   Press ⬭ SYS until the GPS tab is active. The following screen appears:

GPS tab

Signal strength bar graph

Minimum level

Satellite geometry indicator

Minimum level

Skyplot

Satellites being used to compute positions
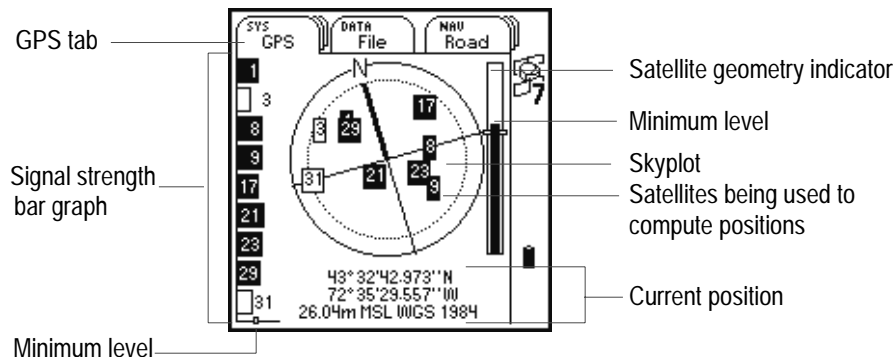
Current position

2.   Use the skyplot to check the satellites that the GeoExplorer 3 is currently tracking.

Black boxes represent satellites that the GeoExplorer 3 is using to compute its current GPS position. Unfilled boxes represent satellites that the GeoExplorer 3 is getting signals from, but not using because the signals are too weak. In the above example, eight satellites are being tracked, and seven are being used to compute GPS positions.

NOTE   Numbers with no box represent satellites that are available, but that the GeoExplorer 3 is not receiving signals from.

NOTE   The skyplot rotates as you change direction (like a compass). It indicates what direction the GeoExplorer 3 is pointing to. (If the skyplot does not rotate, you may need to calibrate the internal compass—see Calibration, page 27-8.)

Data Collection

Your current GPS position is displayed at the bottom of the screen.

3.   Use the signal strength bar graph (on the left), to check the signal strength of the satellites. If the strength of a GPS signal is below the configured minimum level, there may be some obstruction blocking the signal.

4.   Use the satellite geometry indicator (on the right), to view the overall quality of the GPS positions. This is determined by the geometry of the satellites. When the bar is above the configured minimum level indicator GPS positions are being computed.

For more information, see The GPS Tab, page 17-1.

Data Collection

6.1.4 Creating a New File

Before you can start a data collection session, you need to create a new file:

1. Press ⬭DATA⬭. The File Tab (see page 21-1) appears:
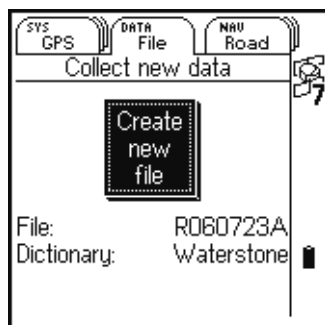
The GeoExplorer 3 data collection system automatically enters a name in the File (see page 21-4) field. You can change the name of the file, but for the purposes of this tutorial leave it as it is.

2. In the Dictionary field, check that the Waterstone data dictionary that you created in the office appears.

NOTE The latest data dictionary file and configuration file transferred to the GeoExplorer 3 automatically become the defaults.

NOTE The data dictionary you select when creating a data file is always associated with that file. Once the file is created, it is not possible to change its data dictionary.

3. All information in the form is correct, so press (ENTER). The file is created and the New feature list appears:
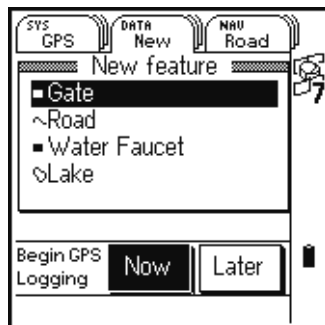
The New feature list contains all the features in the data dictionary that you created in the office.

You are now ready to collect data.

Data Collection

6.2   Collecting Data

The GeoExplorer 3 data collection system is tracking satellites and you have created a new file, so you are ready to start collecting data. This part of the tutorial gives step-by-step instructions for the following tasks:

- Collecting a Point Feature, page 6-11
- Collecting a Line Feature Using the Later Button, page 6-15
- Collecting a Point Feature Using the Later Button, page 6-18
- Collecting an Area Feature, page 6-21

6.2.1 Collecting a Point Feature

1. The first point feature that you want to collect is a gate. Gate is already highlighted in the New feature list, so press (ENTER). The Gate form appears and the GeoExplorer 3 starts logging positions.
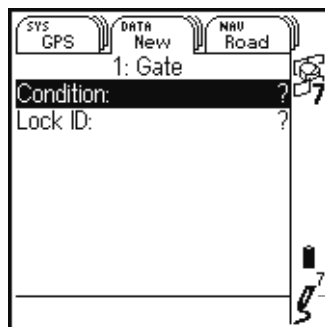
When the GeoExplorer 3 starts logging GPS positions the logging icon appears at the bottom of the status bar. The number above the icon indicates how many positions have been logged for the selected feature.

Logging icon

You can remain stationary at a point for a period of time. The GeoExplorer 3 will record a number of GPS positions during this time, based on the configured logging interval set when the feature was defined in the Data Dictionary Editor. After differential correction of the positions, they are averaged together (using the GPS Pathfinder Office software) to produce an accurate position for the point feature.

Data Collection

2. Enter the Condition attribute for the gate. The Condition field is already highlighted, so press ENTER. A Pop-up list (see page 15-47) of values that was defined in the data dictionary appears:
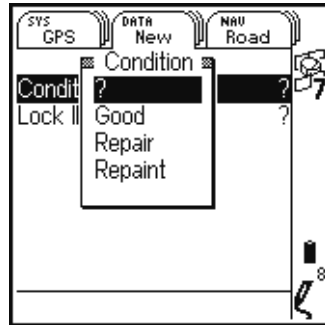
3. The condition of the gate looks good. Use the arrow keys to highlight Good, then press ENTER. The GeoExplorer 3 automatically goes to the next attribute in the form.

4.   To enter the Lock ID number press ⌨ENTER. Lock ID is a numeric attribute, so a Numeric entry (see page 15-44) field appears:
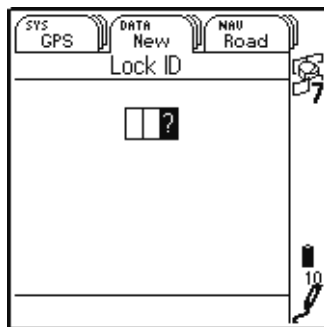
The number on the lock is 43. By default, the rightmost cell is highlighted. Press △ to scroll the displayed number to 3. Press ◁ to move one cell to the left. Press △ to scroll the displayed number to 4. Press ⌨ENTER to accept the value for the Lock ID.

Data Collection

You have collected all the positions and attribute information needed for the gate.
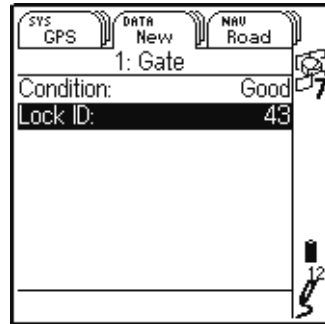
5. To close the gate feature press (CLOSE).

The message Feature stored appears briefly at the bottom of the screen to confirm that you have saved the feature.

6.2.2   Collecting a Line Feature Using the Later Button

1.   From the New feature list, press ▽ to highlight Road.

You can record the attributes of the road without logging GPS positions.

2.   Press ▷ to highlight the Later button, and press ⟨ENTER⟩. The Road form appears:

Pause
icon

In order to record a line feature, travel along the line. As you do so, the GeoExplorer 3 will log a GPS position at the configured interval set when the feature was created in the Data Dictionary Editor. These positions are joined together to form a line.

NOTE   When you use the Later button, a pause icon flashes over the logging icon to let you know that the GeoExplorer 3 is not logging GPS positions.

Data Collection

3. The Name field is already highlighted, so press ⏎ENTER. Use the Text entry (see page 15-37) field to type the name of the road, **PINE ROAD**:
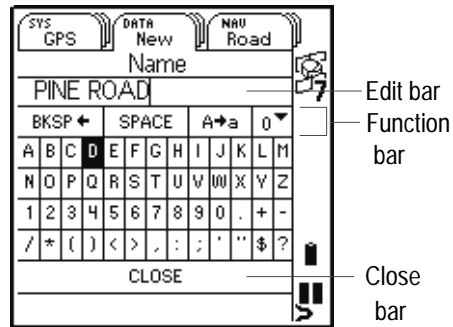
Use the arrow keys on the GeoExplorer 3 handheld to highlight the letter P and then press ⏎ENTER. A "P" appears in the edit bar near the top of the screen. Continue selecting appropriate letters until you have completed the word PINE. Use the SPACE function (in the function bar) to add a space between words in the edit bar. To do this, highlight SPACE and press ⏎ENTER. Then enter the word ROAD.

4. When finished, press ⏎CLOSE. Alternatively, highlight CLOSE (at the bottom of the screen) and press ⏎ENTER.

When you created the Name attribute in the office, you specified that it was required. So if you attempt to close the road feature without entering a name, the GeoExplorer 3 warns you that it is required and will not let you go any further:
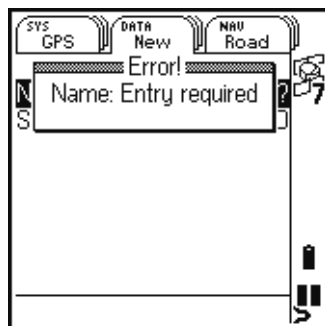
To clear an "Error" message from the screen, press (CLOSE) .

5. The speed limit for Pine Road is 10 mph. When you created the data dictionary in the office you set 10 mph as the default, so in this case you do not need to change the value.

NOTE If you do need to change the value, select the Speed Limit field. A pop-up list appears. From the list select the correct value.

6. Press (LOG) to begin logging GPS positions for the road feature.
7. When you reach the end of the road, press (CLOSE) to close the road feature.

Data Collection

6.2.3 Collecting a Point Feature Using the Later Button

The next feature you are going to collect is a water faucet. You have not yet reached the water faucet, but you can enter the sample test tube and the date while on the way to it.

1. From the New feature list, press ▽ to highlight Water Faucet.
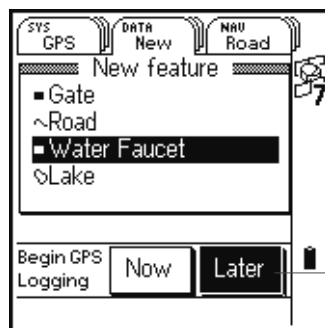
Use the Later button to start recording the attributes for a feature before you actually get to it.

Later button

2. The Later button is already highlighted, so press ⌈ENTER⌋.

Data Collection

3. The Water Faucet form appears:

NOTE   When you use the Later button, a pause icon flashes
over the logging icon to let you know that GeoExplorer 3
is not logging GPS positions.

Pause
icon

4. Enter the attributes for the water faucet
now, so that when you arrive at the
feature, you can start logging GPS
positions.

5. Select the Test Tube Number field and
enter `132`. For more information, see Numeric entry, page 15-44.

6. The date attribute automatically appears. This is because you set the date to auto-generate when
you created it in the office. If you need to, you can edit the value by selecting the Date field. A
numeric entry field appears.

7. When you reach the water faucet feature, press ⬭LOG. The GeoExplorer 3 starts logging GPS
positions for this feature and the pause icon disappears.

8. Select the ID Number field and enter `15`.

9. Record sufficient positions, then press ⬭CLOSE to close the feature and store it.

Data Collection

10. Repeat this procedure to create two more water faucet features. Use these values shown below for the Test Tube Number and ID Number fields:

SYS GPS	DATA New	NAV Road
4: Water Faucet		
ID Number:		16
Test Tube Number:		122
Date:	09/12/2000 Tue	

SYS GPS	DATA New	NAV Road
5: Water Faucet		
ID Number:		14
Test Tube Number:		112
Date:	09/12/2000 Tue	

Data Collection

6.2.4   Collecting an Area Feature

1.   From the New feature list, press $\triangledown$ to highlight Lake feature.

2.   Press $\triangleleft$ to highlight the Now button, and press ⏺ENTER.

The GeoExplorer 3 starts to log positions. When you created this feature in the office, no attributes were assigned.
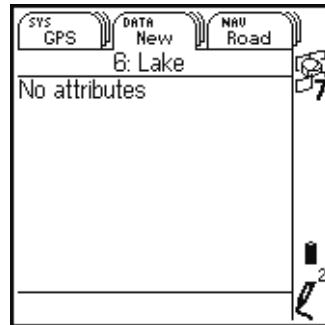
In order to record an area feature, you travel around the perimeter of the area. As you do so, the GeoExplorer 3 will log a GPS position at the configured interval set when the feature was created in the Data Dictionary Editor. These positions are joined together to form the perimeter of the area.

The first and last GPS positions are joined together to close the area, so there is no need to return to the start point.

3.   You can view the DATA map while collecting features. To do this, press ⬭DATA until the Map tab is active. The features that you collected are displayed on the map, along with the lake perimeter that you are currently collecting.
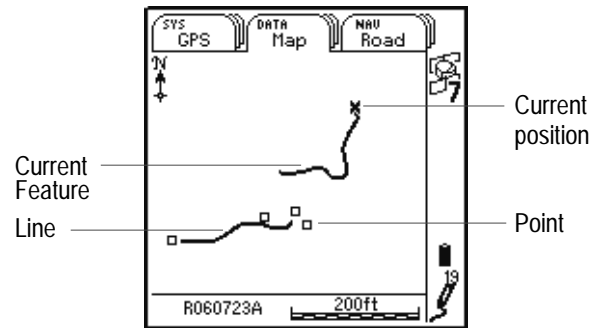
You can view the map at different scales. To do this, press ⬭OPTION. Select the Zoom in/Zoom out option.

NOTE   Depending on the scale you are using to view your map, it may look different to the map shown above.

4.   You can pause logging if required.

For example, if you are driving around the perimeter of the lake and you want to stop and examine a picnic shelter some distance from the lake, you would stop logging positions for the lake boundary. To do this, press ⬭ LOG . The GeoExplorer 3 stops logging positions and a pause icon flashes over of the logging icon. To continue collecting the lake feature, press ⬭ LOG again to resume logging. The pause icon disappears.

For more information, see Pause and Resume Logging, page 22-8.

5.   Press ⬭ DATA to go back to the New tab. The Lake form is still active and the GeoExplorer 3 is still logging positions for the lake.

6.   When you have driven around the perimeter of the lake, press ⬭ CLOSE to close the feature.

TIP   There are several advanced techniques that you can use to make data collection more efficient. For more information, see Advanced Data Collection, page 11-1.

Data Collection

6.3   Closing a File

When the data collection session is completed, turn off the GeoExplorer 3 handheld. This automatically closes the data file.

To turn off the GeoExplorer 3 handheld, press ⬭. The data file is closed, and the handheld is turned off.

TIP   To close the data file that you are using and start a new file, press ⬭CLOSE⬭ until the File tab appears.

Data Collection

7   Processing the Data

When you return from your data collection session in Waterstone National Park, use the GPS Pathfinder Office software to process the data collected and transfer it to the GIS.

This part of the tutorial shows you how to transfer, process, and view the data. Topics are:

- Transferring Data, page 7-2
- Differentially Correcting Data, page 7-4
- Viewing Data, page 7-9
- Exporting Data to a GIS, page 7-12

Processing the Data

7.1   Transferring Data

You need to transfer the data collected in the field from the GeoExplorer 3 to the office computer. Transferring data from the GeoExplorer 3 data collection system to the office computer is easy.

1. Place the GeoExplorer 3 handheld in the GeoExplorer 3 Support Module (see page 3-11). Make sure that the support module is connected to the office computer.

    The GeoExplorer 3 is ready to communicate with the GPS Pathfinder Office software.

2. In the GPS Pathfinder Office software, select Utilities / Data Transfer.

    The Data Transfer dialog appears.

3. From the Device list, select the device name that represents the GeoExplorer 3 handheld.

    You can use one of the predefined names (GIS Datalogger on COM 1 or GIS Datalogger on COM 2, depending on which serial (COM) port the support module is connected to) or you can set up a new device definition for your GeoExplorer 3 handheld.

    The Data Transfer utility automatically connects to the GeoExplorer 3 handheld.

4. Select the Receive tab.

5. Click **Add and select Data File from the list**.

    The Open dialog appears. The files shown are the current files on the data collector.

6. Select one or more files to be transferred. Highlight the filename(s) and click **Open**.

Processing the Data

The Open dialog disappears, and the selected data files appear in the Files to Receive list:
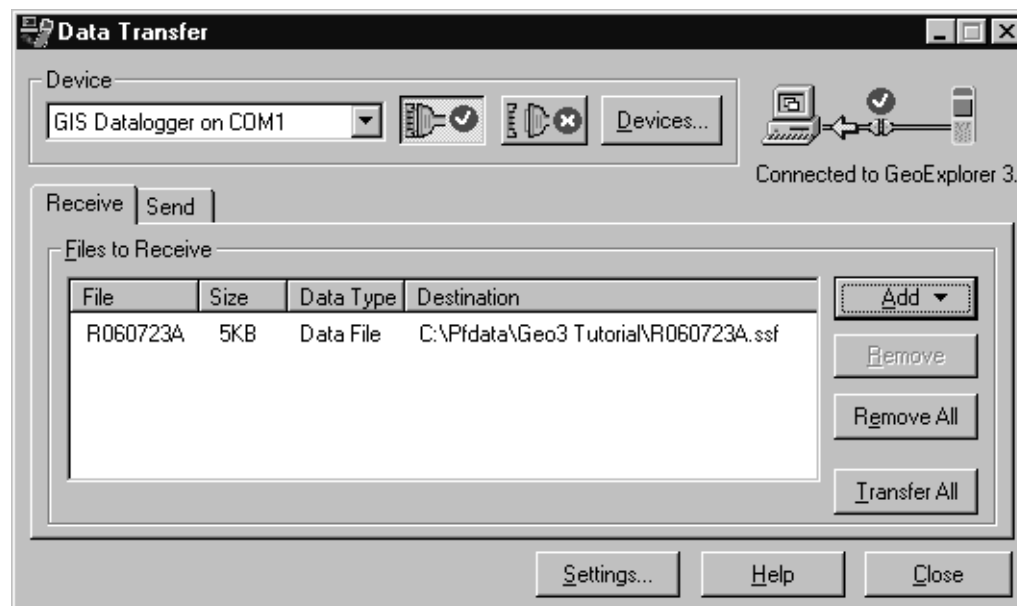
The Destination that the files are to be transferred to will default to the current project folder.

7.   Click **Transfer All**. The data files are transferred to the GeoExplorer 3 handheld.

8.   A message showing summary information about the transfer appears. Click **Close** to close it.

9.   To close the Data Transfer utility, click **Close**.

NOTE   You can also use the Data Transfer utility to transfer waypoint or almanac (see Glossary-2) files. For
               more information, refer to the GPS Pathfinder Office Help.

7.2 Differentially Correcting Data

The data collected by GPS receivers is subject to errors, including satellite clock and atmospheric errors. Differential correction can remove much of the error from the data, and improves the accuracy of GPS positions to the specified accuracy of the receiver.

1. In the GPS Pathfinder Office software, start the Differential Correction utility by selecting Utilities / Differential Correction. The last file(s) transferred from the GeoExplorer 3 appears in the Selected Files field.

Processing the Data

The following dialog appears:
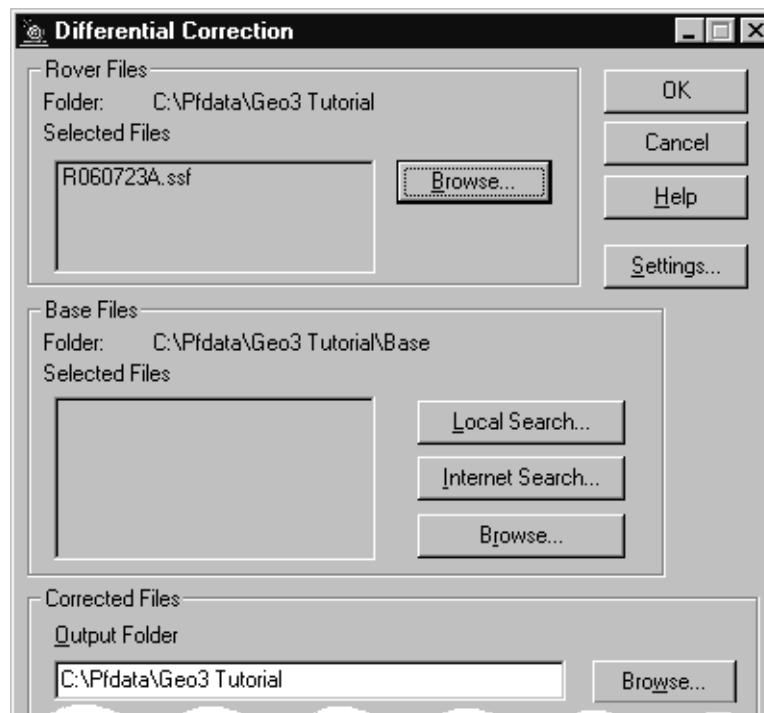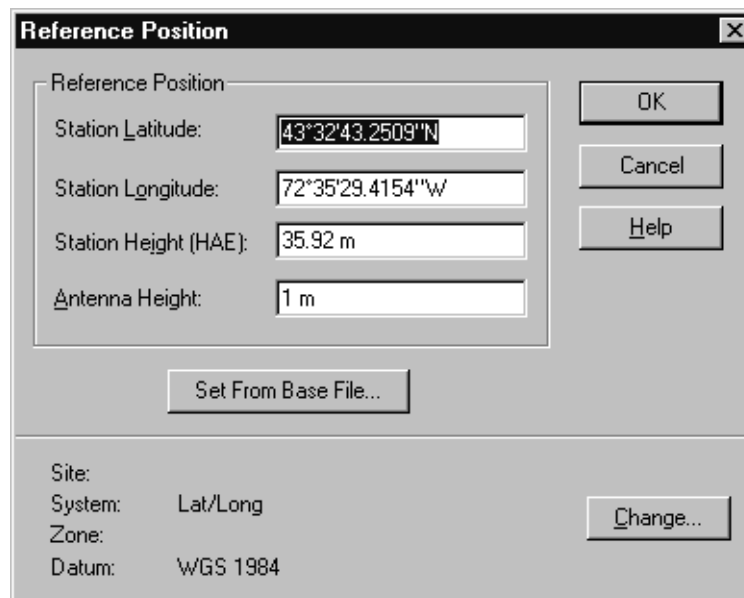
2.   Specify the location of your base files.

Processing the Data

Depending on the source of base files, there are three options available: Local Search for base files, Internet Search for base files, or Browse. By default, base files are stored in the current project's base file folder on your local drive. If you need to change the Folder path for the Local Search for base files option, click **Browse**. Once you have searched for or selected the base files, the Confirm Selected Base Files dialog appears:

Confirm Selected Base Files					
Rover Files and Matching Base Files					OK
Rover File	Coverage	Base File	Start Time	End Time	Cancel
⊟ R060723A.ssf	100%		6/2/01 4:53:42PM	6/2/01 4:53:42PM	Help
		T9060804.ssf	6/2/01 4:42:13PM	6/2/01 4:59:46PM	
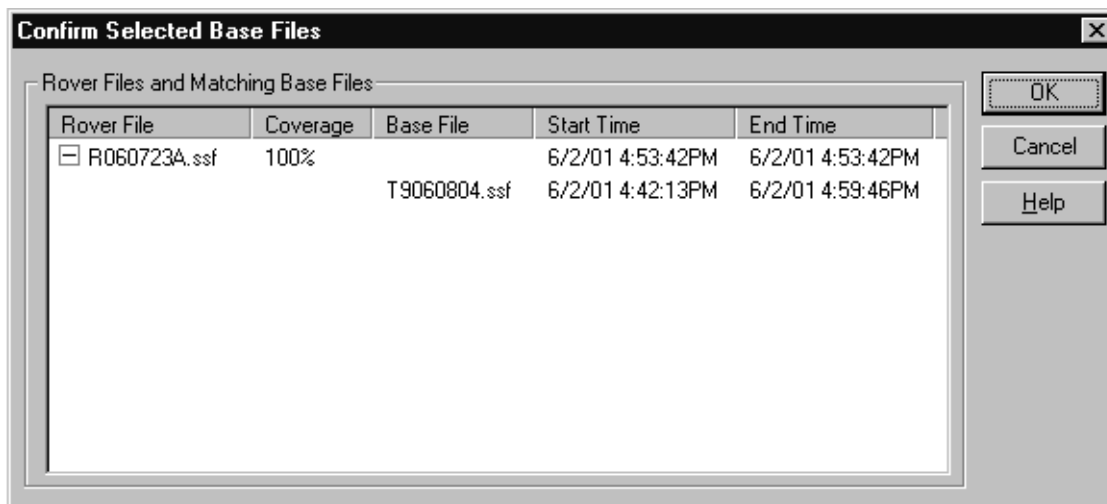
3. Use the Confirm Selected Base Files dialog to make sure the selected base files provide coverage for the rover files. Click **OK**. The Reference Position dialog appears:

4. Click **OK** to confirm the reference position.
5. Specify the output folder. By default, the output folder is the current project folder.

6. Select a processing option.
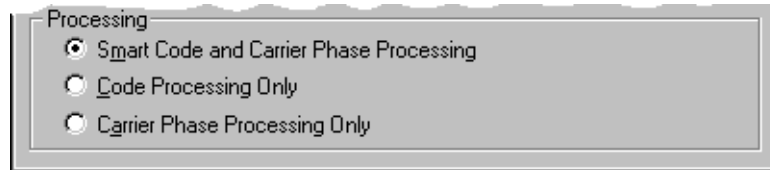
By default, Smart Code and Carrier Phase Processing is selected.

7. Click **OK** to differentially correct the selected files.

8. The Differential Completed dialog details the results of the differential correction. Click **Close** to close this dialog.

7.3   Viewing Data

When the data has been transferred and differentially corrected you can display, edit, and plot it. The GPS Pathfinder Office Map window is the best way to view field data. Use it to make graphical queries and measurements on the collected data. You can specify the colors, symbols, and line styles for each feature. The Map window provides an easy way to verify the integrity of the field data.

To view the data:

1.   From the GPS Pathfinder Office menu bar, select File / Open. Select the data file(s) that you want to view. The current project folder is the default path (C:\Pfdata\Geo3 Tutorial).

Processing the Data

2. From the GPS Pathfinder Office menu bar, select View / Map:
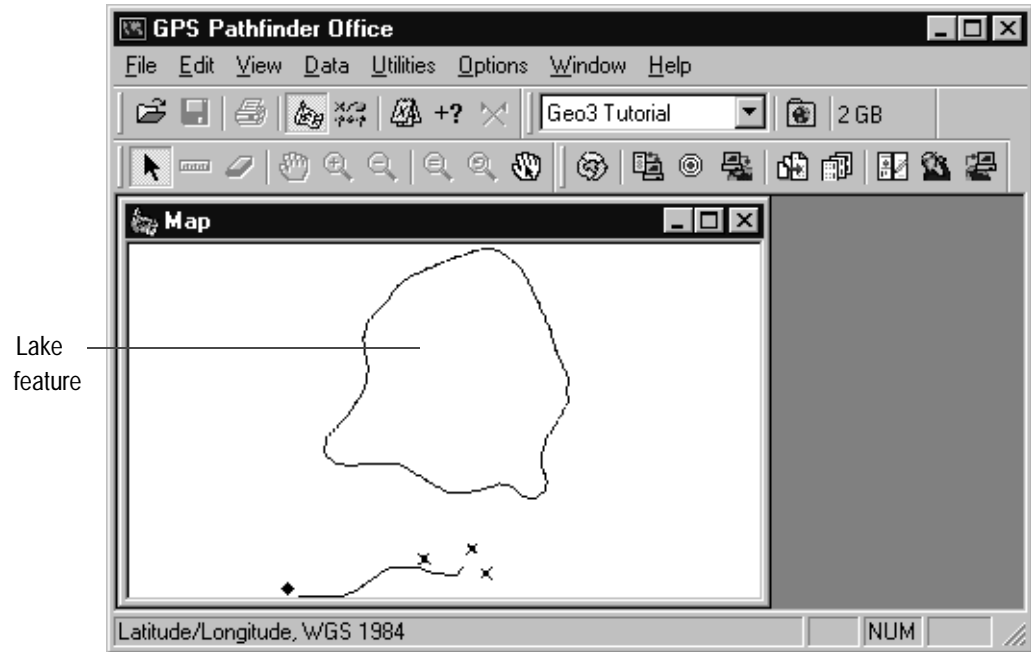
Lake feature

The Map window displays the selected file.

3. To display the attributes of any feature on the map, double-click the feature. The Feature Properties dialog appears. It provides attribute information about the selected feature.

4. Change the color of the Lake feature. Right-click the
    Lake feature on the map. From the shortcut menu select
    Lake Layer Style. The Lake style dialog appears. Use
    this dialog to change the color of the lake area to blue.

5. You can also measure between positions and features,
    and compute areas. For example, you can compute the
    distance between the Road feature and the Lake
    feature. To do this, select Data / Measure from the GPS
    Pathfinder Office menu bar. The cursor becomes a ruler
    when the Map window is displayed. Click a point on the
    Road feature. Then click a point on the Lake feature.
    The distance between the two points is computed and
    displayed at the bottom of the screen.
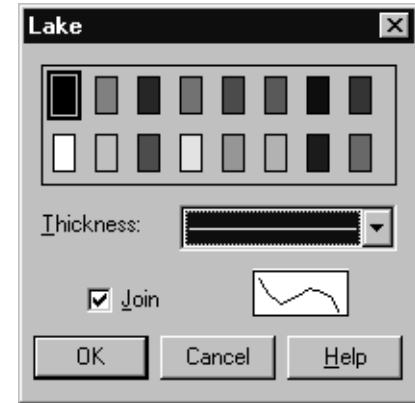
For more information about the GPS Pathfinder Office Map window display, refer to the View menu topic
in the GPS Pathfinder Office Help.

NOTE   After using the Map window in the GPS Pathfinder Office software to edit data, you can export the
               data to your GIS.

7.3.1 Exporting Data to a GIS

The Export utility in the GPS Pathfinder Office software converts .ssf file (see Glossary-1) format files into a format that can be read by a GIS or CAD system. It lets you export point, line, and area features, (together with their attributes and GPS positions) to a variety of other formats.

To export data to a GIS:

1.   In the GPS Pathfinder Office software, start the Export utility by selecting Utilities / Export:
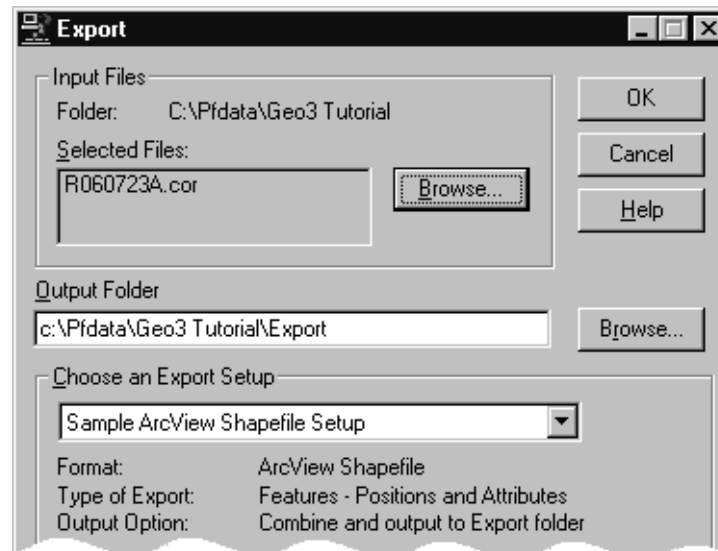
By default, the last file(s) differentially corrected appear(s) in the Selected Files field.

2.   Select the output folder. By default, this is the export folder in the current project.

3.   Select the Export setup.

4.   Click **OK** to export the selected file(s) to the specified GIS format.

5.   The Export Completed dialog details the results of the export. Click **Close** to close this dialog.

6.   The file is now in the format required by your GIS. You can now open it in your GIS.

NOTE   You can increase productivity by automating repetitive tasks, such as transfer, differential correction, and export, using the Batch Processor. When you come back from the field, simply place the GeoExplorer 3 handheld in the GeoExplorer 3 Support Module (see page 3-11). The Connection Manager utility automatically recognizes that the GeoExplorer 3 is in the support module and runs the Batch Processor. Set up the Batch Processor to meet your data requirements.

For more information about batch processing, refer to the GPS Pathfinder Office Help.

8   Preparing for Update

NOTE   Data update, using transferred .ssf files, is not available with the GeoExplorer 3c Edition, page 2-5.

A month has passed and it is necessary to re-sample the water faucets in Waterstone National Park. A different Park Ranger is going to be doing this. The GeoExplorer 3 data collection system and a real-time source will be used to navigate to each faucet, and the Waterstone data dictionary will be used to verify and update the attributes for those faucets. This part of the tutorial gives step-by-step instructions that should be performed when preparing to take the GeoExplorer 3 and the Beacon-on-a-Belt (BoB) receiver into the field to update data. Topics are:

- Using Real-Time Differential Corrections, page 8-2
- Checking the Memory, page 8-3
- Deleting Files, page 8-4
- Locking the Configuration and Tasks, page 8-6
- Transferring GIS Data, page 8-10
- Checking the Equipment before Going into the Field, page 8-15

8.1   Using Real-Time Differential Corrections

To update existing data, back in the field, you can navigate to features and waypoints using the Road, Compass, or Chart tabs. Using RTCM (see Glossary-16) real-time corrections you can accurately navigate to any specific location.

In this tutorial, you use the Beacon-on-a-Belt (BoB) Receiver (see page 3-21) real-time source to receive RTCM and transmit the information to the GeoExplorer 3. The GeoExplorer 3 then applies the differential corrections to GPS positions computed in the field. This gives greater accuracy and saves postprocessing time in the office.

By default, the GeoExplorer 3 data collection system is configured to use RTCM. If necessary, you can change the Real-time (see page 19-21) settings using the GeoExplorer 3 (in the field) or the Configuration Manager (in the office).

NOTE   If you do not have the Beacon-on-a-Belt (BoB) receiver, you can use an alternative source of real-time differential corrections.

8.2   Checking the Memory

Before using the GeoExplorer 3 to verify and update existing GIS data in the field, transfer these data files. Before transferring them to the GeoExplorer 3, check the memory level to make sure that sufficient space is available. If necessary, delete old files to make space for the GIS data.

To check the memory levels using the Status tab:

1.   Press ⬭ to turn on the GeoExplorer 3 handheld.

2.   Press ⬭SYS⬭ until the Status tab is active:
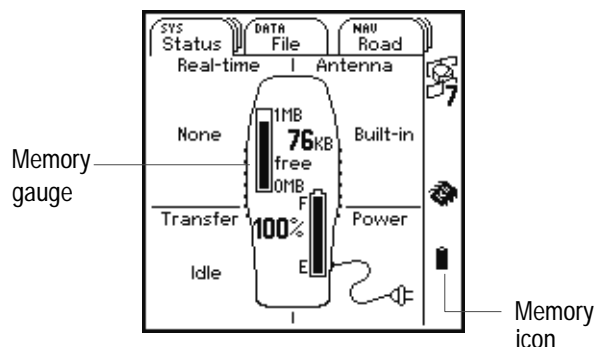
In this case there is not much remaining memory. For this project, you need to delete some files to create space before transferring the GIS files.

See Deleting Files, page 8-4.

NOTE   When the memory level is low, the memory icon flashes in the Status Bar (see page 15-13).

8.3   Deleting Files

Deleting files creates space on the GeoExplorer 3 data collection system so that you can transfer data and collect new data. The amount of space required depends on the project.

To delete files:

1.   Press ⬭DATA⬭. The File tab appears.

NOTE   If a file is currently open, press ⬭CLOSE⬭ to close it. Otherwise the File tab is not displayed.

2.   Press ⬭OPTION⬭ and select Delete file(s). The Delete file(s) list appears:
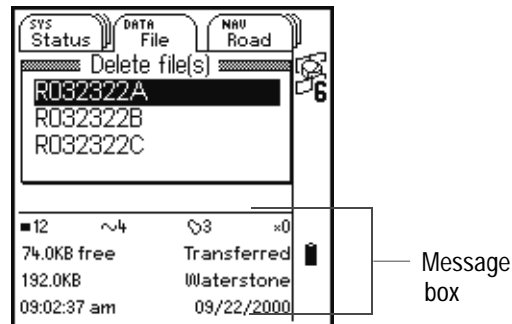
The message box displays information about the highlighted file in the list and shows the free space on the GeoExplorer 3 data collection system.

Message box

Preparing for Update

3.   Use the Delete file(s) list to select the file that you want to delete and press (ENTER) . You are prompted to confirm deletion. Select Yes to delete the file:
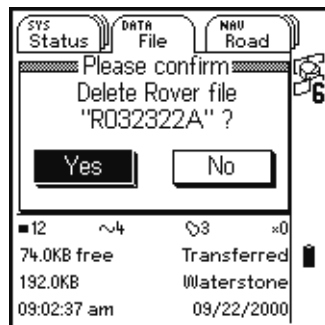
4.   Press (CLOSE) to close the Delete File(s) (see page 21-7) list.

NOTE   If the selected data file has not been transferred to the office computer, the Please confirm message appears: `File 'x' has not been transferred to the PC: Delete anyway?`. Select Yes to delete the file. Select No to cancel the deletion.

8.4   Locking the Configuration and Tasks

When you set up a configuration in the office, you may want to protect it to make sure that it is not changed in the field. This makes sure that the data collected meets your specifications. You can also protect certain tasks to prevent files from being deleted or changed in the field. Use the Configuration Manager utility in the GPS Pathfinder Office software to apply a password to the configuration and specific tasks.

This month you will be unable to go and collect the water samples personally. A member of your field crew will be collecting them. You can lock the GeoExplorer 3 data collection system so that data files cannot be deleted. To do this:

1.   Start the Configuration Manager utility by selecting Utilities / Other / Configuration Manager.

2.   Select File / New. A configuration dialog appears.

3.   In the Configuration field, type `Waterstone1`.

4.   Make sure the Data tab is selected.

5.   Highlight the Log between features field. You do not need to log any GPS data between features because such data is not required for this project. Lock this field so that no GPS data is collected unless a feature is being recorded.

6. Select the Password locked check box (at the bottom of the dialog). This locks the Log between
    features field.
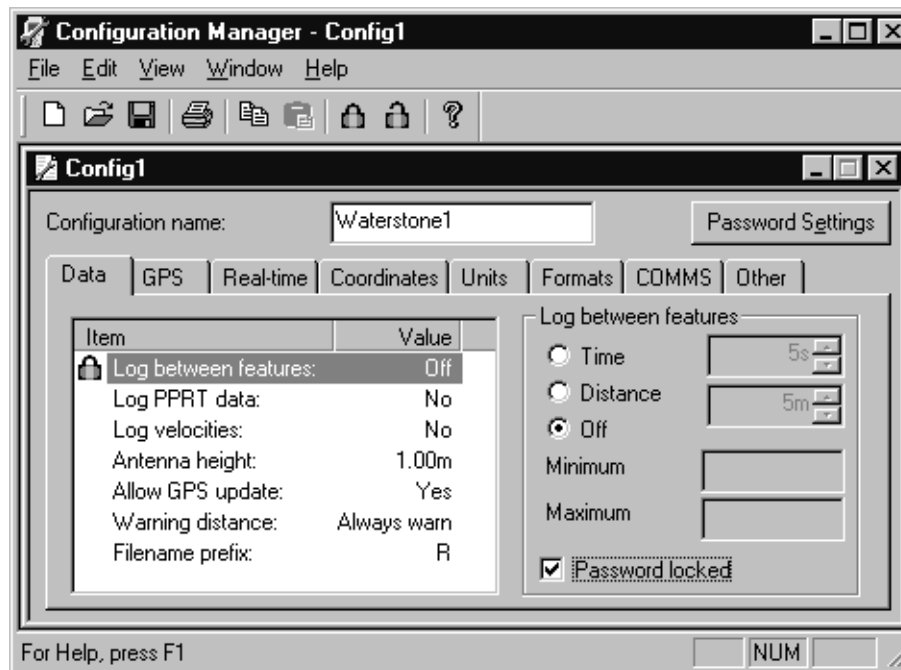
7. Click **Password Settings**. The Password Settings dialog appears.

8.   Select the Data files: Delete check box and type the password in the Password field:

9.   Click **OK** to accept the password and lock the selected task(s).

NOTE   You will need this password to delete any data files on the GeoExplorer 3 once in the field.

10.   Save the new Waterstone configuration. You can add the configuration file to the same folder as the data dictionary files. (For example, C:\Pfdata\Geo3 Tutorial).

11.   Select File / Exit to close the Configuration Manager utility.

For more information, refer to the GPS Pathfinder Office Help.

TIP   Locking and unlocking is useful when you do not want certain settings to be changed. If you create a configuration for a certain job and do not want it altered, lock it by applying a password.

8.5   Transferring GIS Data

Before going into the field for a data update session, transfer the required information from the GIS to the GeoExplorer 3 data collection system. In the GPS Pathfinder Office software, use the Import utility to convert data from a GIS data format into the .ssf file (see Glossary-1) format required by the GeoExplorer 3. Then use the Data Transfer utility to efficiently transfer data between the office computer and the GeoExplorer 3.

This part of the tutorial outlines how to transfer GIS data to the GeoExplorer 3 data collection system.

To convert GIS data to SSF format:

1.   Start the Import utility. From the GPS Pathfinder Office menu bar, select Utilities / Other /Import:
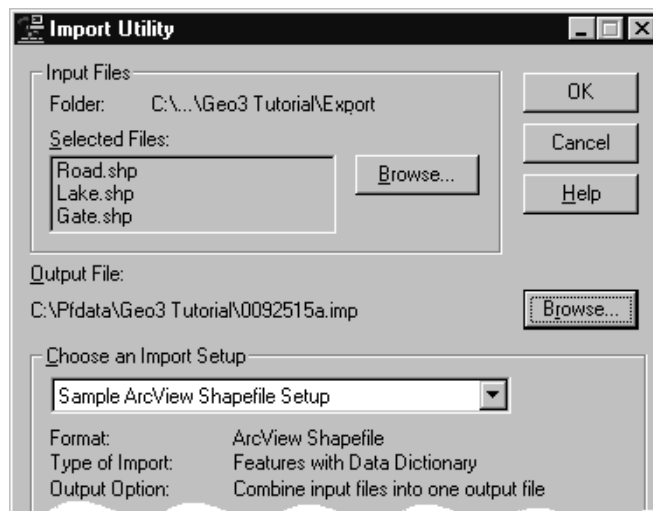
2.   Click **Browse** and select the input file(s). By default, the path specified for the output file is the current project folder.

3.   In the Choose an Import Setup group, select an import setup.

4.   Make sure that all import settings are correct. Click **Properties** to make changes.

5.   Click **Browse** to change the output folder or filename.

6.   Click **OK** to import the file(s).

For more information, refer to the GPS Pathfinder Office Help.

8.5.1   Transferring Files to the GeoExplorer 3 Data Collection System

NOTE   Data update, using transferred .ssf files, is not available with the GeoExplorer 3c Edition (see page 2-5).

Once the data from the GIS is imported into the GPS Pathfinder Office software, use the Data Transfer utility to transfer it, and the configuration file that you created in Locking the Configuration and Tasks, page 8-6, to the GeoExplorer 3.

NOTE   When you transfer a data file from GPS Pathfinder Office to the GeoExplorer 3, the associated data dictionary is automatically transferred with the file.

To transfer files to the GeoExplorer 3 data collection system:

1.   Start the Data Transfer utility. From the GPS Pathfinder Office menu bar, select Utilities / Data Transfer.
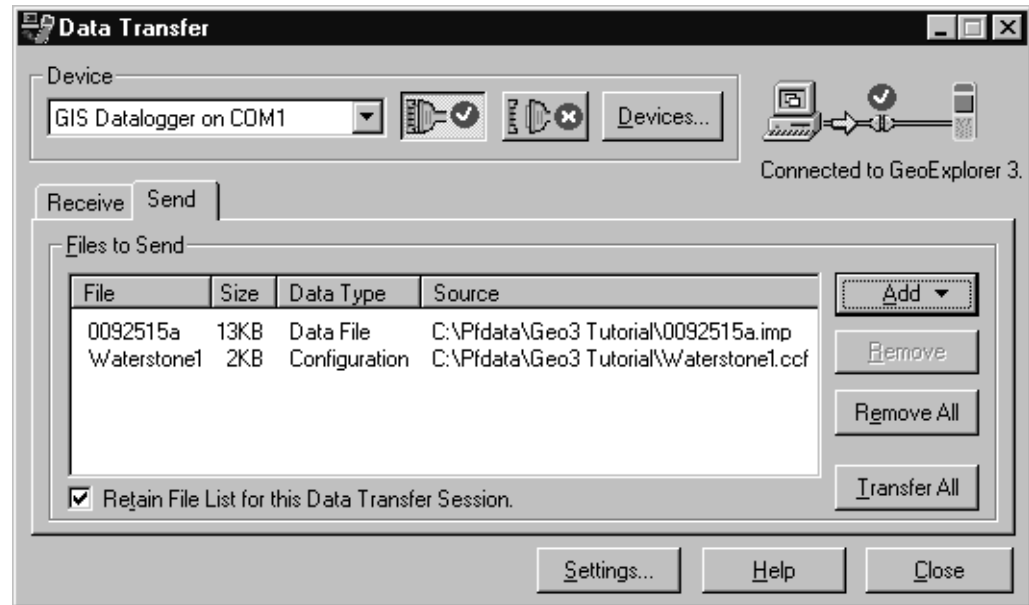
     The Data Transfer dialog appears.

2.   From the Device list, select the device name that represents the GeoExplorer 3 handheld.

     You can use one of the predefined names (GIS Datalogger on COM 1 or GIS Datalogger on COM 2, depending on which serial (COM) port the support module is connected to) or you can set up a new device definition for your GeoExplorer 3 handheld.

     The Data Transfer utility automatically connects to the GeoExplorer 3 handheld.

3.   Select the Send tab.

4.   First, select the data file. Click **Add and select Data File from the list**. The Open dialog appears.

5.   The data file that you imported appears in the list of files. Highlight it and click **Open**.

6.   Now select the configuration file to send. Click **Add and select Configuration File from the list**. The Open dialog appears.

7.   Select the folder where the configuration file is located. By default, this is the last folder that was used to transfer a configuration file.

8.   The configuration file appears in the list of files. Highlight it and click **Open**.

The Open dialog disappears, and the data file and configuration file appear in the Files to Send list:

9.   Click **Transfer All**.

The data file and configuration file are transferred to the GeoExplorer 3 handheld.

10. A message showing summary information about the transfer appears. Click **Close** to close it.

11. To close the Data Transfer utility, click **Close**.

8.6   Checking the Equipment before Going into the Field

Before going into the field, check that you have the necessary equipment and that it is working correctly.

For the previous tasks the GeoExplorer 3 data collector has been in the support module. You can check if the internal power source is fully charged without taking the handheld out of the support module. If the GeoExplorer 3 is off, use the Standby mode. If the GeoExplorer 3 is on, use the Status Bar (see page 15-13).

Check that the real-time source is fully charged, and that you have the BoB receiver or the cable to connect the real-time source to the GeoExplorer 3 handheld, if necessary.

9 Back in the Field

NOTE Data update, using transferred .ssf files, is not available with the GeoExplorer 3c Edition (see page 2-5).

Your supervisor has sent you to Waterstone National Park to collect the monthly water samples. The configuration and data files have been transferred onto the GeoExplorer 3 data collection system for you, but before starting the data update session, there are some tasks that you need to complete. You can then use the GeoExplorer 3 and the real-time source to navigate back to the water faucets and update the attributes.

This part of the tutorial contains step-by-step instructions for updating existing GIS data, using real-time corrections, and navigating. Topics are:

- Initial Tasks, page 9-2
- Navigating to and Updating Features, page 9-7
- Creating a Waypoint, page 9-21
- Closing the File, page 9-23

Data Update

9.1   Initial Tasks

Before starting a real-time data update session, complete the following tasks:

- Checking the GPS Status, page 9-3
- Configuring the GPS Slider Bar, page 9-3
- Checking the Real-Time Status, page 9-6

9.1.1   Checking the GPS Status

The GeoExplorer 3 needs a minimum of four satellites, with good geometry, in order to compute a 3D GPS position. When you turn on the GeoExplorer 3 data collection system, it automatically starts to track visible satellites and to calculate its current position. Use the satellite icon in the Status Bar (see page 15-13) to check if the GeoExplorer 3 is computing satellite positions. If the satellite icon and the number below it are not flashing, the GeoExplorer 3 is computing GPS positions.

If the satellite geometry is poor, or there are too few satellites available to compute GPS positions, adjust the GPS slider bar or wait until conditions are more favorable.

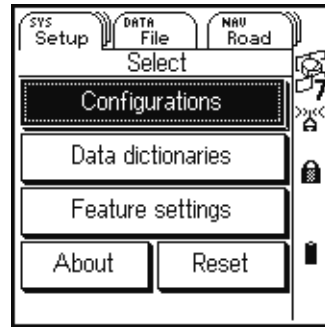### 9.1.2   Configuring the GPS Slider Bar

There are some critical settings in the GeoExplorer 3 data collection system that you should configure before collecting data (for example, the GPS settings and logging intervals). Configure these before leaving the office, or in the field. You can also set other (non-critical) settings to suit your application or preferences.

The following steps show you how to configure the GPS slider bar to best suit the environment of Waterstone National Park.

Waterstone National Park is mostly forest area. This type of environment has several areas where the tree canopy obstructs the view of the sky. Therefore, you need to adjust the GPS slider bar from the default middle position to Low to allow more positions to be recorded. Some of the positions recorded may have lower quality, but recording more positions ensures that there are fewer gaps in the data collected.

Data Update

To configure the GPS slider bar:

1.   Press ⬭SYS⬭ until the Setup tab is active.

2.   Highlight Configurations and press ⬭ENTER⬭. The Edit Configuration (see page 19-3) screen
      appears.

3.   Select the GPS button. The GPS slider bar appears:
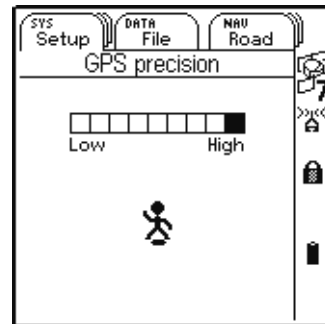
TIP   Use a high setting on the GPS slider bar
             whenever a project requires the highest level of
   precision.

Data Update

4.   Press ◁ to lower the GPS slider bar four notches. This lets you collect more positions, but some may be less precise. Because you are collecting data in a forest area where trees can block your view of the sky, this may provide better overall results. If the slider bar is set too high, the precision of the positions collected is high, but not enough positions will be collected to map the entire park. For more information, see GPS, page 19-9.

NOTE   To adjust the GPS slider bar using the GPS Pathfinder Office Configuration Manager utility, refer to the GPS Pathfinder Office Help.

Data Update

9.1.3   Checking the Real-Time Status

When using the Beacon-on-a-Belt (BoB) Receiver (see page 3-21) to provide real-time corrections, always check the real-time status before recording data or navigating. Use the Status tab to view the real-time status.

Press ⬭SYS until The Status Tab (see page 18-1) is active.

Real-time information
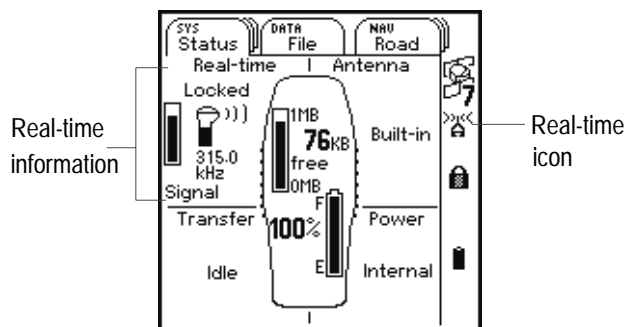
Real-time icon

Use this screen to check that the GeoExplorer 3 is receiving corrections from the Beacon-on-a-Belt (BoB) receiver. When the GeoExplorer 3 is receiving differential corrections, the real-time position icon appears. This icon indicates the type of RTCM source. For this tutorial, the Beacon-on-a-Belt (BoB) icon appears.

NOTE   You can also use the Status Bar (see page 15-13) on the right to check that the GeoExplorer 3 data collection system is computing real-time corrected positions. When the GeoExplorer 3 is computing real-time corrected positions, the real-time position icon appears. This icon flashes if there is a problem with the real-time source connection, or there is no GPS position.

Data Update

9.2   Navigating to and Updating Features

When updating GIS data, use THE NAV SECTION (see page 25-1) to navigate to features recorded previously. The GeoExplorer 3 data collection system provides three methods to navigate—a road, a compass, and a chart view. Select the method that suits your application or personal preference.

You did not record the original water faucet features, so you do not know where they are. Use the GeoExplorer 3 data collection system and a real-time source to navigate to them.

There are different ways to select a feature and navigate to it. In this section the following tasks are explained:

- Opening a Data File, page 9-8
- Using the Search Function, page 9-10
- Updating the Data, page 9-15
- Navigating to a Target Using the Chart Tab, page 9-17
- Navigating to a Target Using the Road Tab, page 9-19

Data Update

9.2.1 Opening a Data File

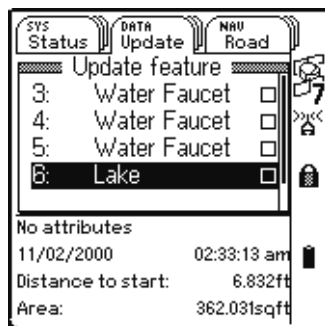Before starting the data update session, open the file that contains the GIS data. Use the File tab to do this.

To open an existing file:

1. Press ⬭ DATA ⬭. The File tab appears.
2. Press ▷ to highlight Open selected file.
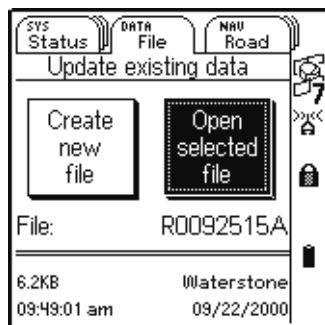
The data file that you transferred from the GIS is automatically selected in the File field as this was the last data file transferred to the GeoExplorer 3.

3.   Press ⊂ENTER⊃ to open the selected file. The Update feature list appears:

```
┌─────────────────────────────┐
│ ┌SYS─┐┌DATA──┐┌NAV──┐        │
│ │Status││Update││Road │       │
│ ═══ Update feature ═══   🛰  │
│  3:    Water Faucet    □   7  │
│  4:    Water Faucet    □  ⁾ᵪ‹ │
│  5:    Water Faucet    □      │
│ ▓6:▓▓▓▓Lake▓▓▓▓▓▓▓▓▓▓▓□  🔒  │
│                              │
│ No attributes                │
│ 11/02/2000       02:33:13 am ▐│
│ Distance to start:     6.832ft│
│ Area:              362.031sqft│
└─────────────────────────────┘
```

You have opened a data file, so you can now navigate to the features to update them.

Data Update

9.2.2 Using the Search Function

When you have many features to select from, and you know which feature you need to visit based on an attribute value, you can search for it.

To search for a target:

1. Press (OPTION) to display the options for the Update feature list.

2. Press ▽ and highlight Search.

3. Press (ENTER) to display the Search form:

```
┌─────────────────────────────────┐
│ ╭SYS──╮╭DATA──╮╭NAV──╮          │
│ │Status││Update││Road │        │
│        Search             ┌─┐   │
│ Direction:    Backwards   └─┘7  │
│ FeatureType:        Any  >X<    │
│ Operator:    Containing   ⌂     │
│ AttributeValue:       ?   🔒    │
│                                 │
│                                 │
│                           ▮     │
│                                 │
└─────────────────────────────────┘
```

4. Press ▽ to highlight the Feature Type field and press (ENTER).

   You will see a list of the features in your data dictionary. You need to search for a particular water faucet.

5. Press the ▽ arrow key to highlight Water Faucet and press (ENTER).

You can now see the Attribute field has been added to the Search form:

6.   Press ⏎ENTER to display the list of attributes for the water faucet.

7.   Press ▽ to highlight ID Number and press ⏎ENTER.

The Operator field can be changed, but the value Equals is sufficient for what you need.

8.   Press ▽ to highlight Attribute Value and press ⏎ENTER.

9.   Type **15** as the attribute value number and press (CLOSE).

Data Update

The value 15 is now shown as the Attribute Value for the water faucet:

10. Press CLOSE to carry out the search.

   Water Faucet 15 is highlighted on the Update feature list. Now all you need to do is set this feature as the target.

11. Press OPTION and highlight Set Target.

12. Press ENTER.

Data Update

You have selected a feature to navigate to. The crossed-flag symbol appears beside the feature to confirm that you have set it as the target:
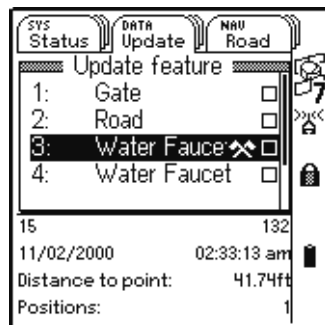
13.   Press (NAV) until the Chart tab is active.

Here the crossed-flag symbol represents the water faucet, and the arrow represents the direction in which you are moving. The Info Windows, page 26-9 at the bottom display the date, time, and current coordinates.
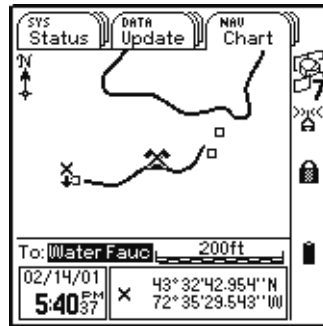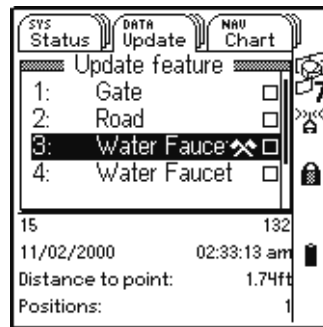

You can use the information on the screen to navigate to the water faucet and take a water sample.

Data Update

## 9.2.3   Updating the Data

Now that you have navigated to the water faucet, return to the Data update tab to update the attributes.

To update a feature:

1.   Press ⊂DATA⊃. The Update feature list appears:

Notice that the water faucet is still highlighted, because you set it as the target.

Data Update

2.   Press ⎛ENTER⎞ to display the attribute entry form for this feature.

3.   The first attribute is the ID Number. Use this attribute to verify that you are updating the correct water faucet. The number on the faucet matches the ID number of the feature you have opened on the GeoExplorer 3 handheld, so select the Test Tube Number attribute. A Numeric entry (see page 15-44) field appears.

4.   Use the Numeric entry (see page 15-44) field to enter the test tube number. The number on this month's test tube is 234, so enter this into the field.

5.   The Date is automatically updated by the GeoExplorer 3 data collection system. Press ⎛CLOSE⎞ to save the attribute changes and return to the Update feature list.
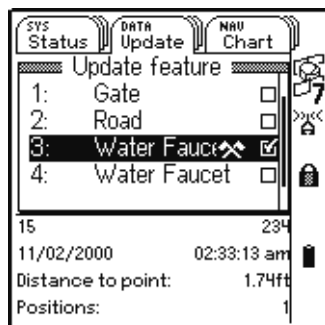
Notice that a tick appears in the check box to show that the water faucet has been updated. For more information, see Updating Attribute Values, page 23-3.

NOTE   A check box appears next to the features in the Update feature list for files transferred from the GPS Pathfinder Office software. When a feature is updated, a ✓ appears in the check box.

Data Update

## 9.2.4 Navigating to a Target Using the Chart Tab

You can also select the features you want to update from the chart view. This is another way of making sure that you are navigating to the correct feature.

1. Press (NAV) until the Chart tab is active.

2. To activate the cursor, press any arrow key. Use the arrow keys to move the cursor towards the closest feature. When the cursor is over the feature, a label appears with the attribute information that you defined in the office—the ID number and Test Tube number—to help you identify the correct faucet.
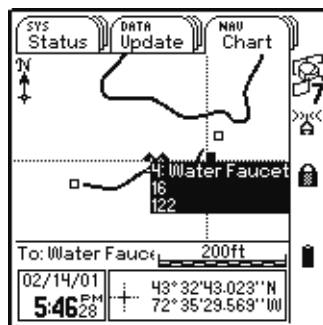
3. With the water faucet feature highlighted, press the (ENTER) key.

Data Update

The Select target screen is displayed:
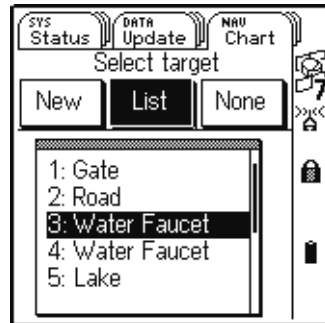
4. Press ⌈ENTER⌉ to accept the highlighted feature as the target.

5. Use the information displayed on the chart to navigate to the selected target.

6. When you reach the target, update its attributes as you did for the first water faucet that you revisited. For more information, see Updating the Data.

9.2.5   Navigating to a Target Using the Road Tab

The Road Tab (see page 26-1) provides useful information, such as distance and direction, to assist you when navigating to a target, especially when traveling in a vehicle.

WARNING   The Road tab displays a straight line bearing to the target. You may not be able to drive directly to a target using this tab as a source of direction.

To navigate to a feature using the Road tab:

1.   Press ⬭NAV⬭ until the The Road Tab (see page 26-1) is active.

2.   From the Option list, choose Select Target and choose another water faucet to navigate to.

The road on the screen moves as you navigate to the selected water faucet feature.

3.   Use the information displayed in the Info Windows, page 26-9 and the animation of the road to navigate to the target.

Data Update
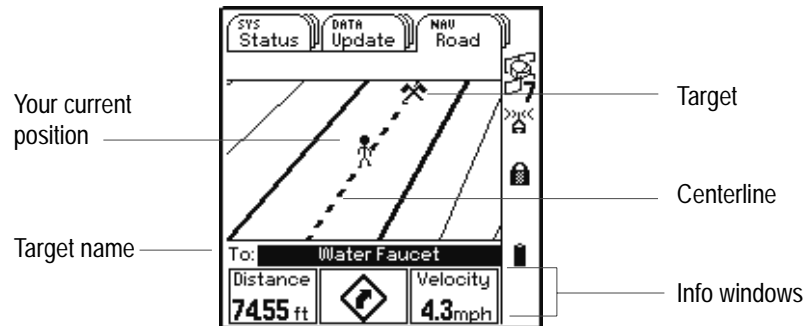
The Road screen displays your current position as a person symbol. The direction you are moving is always towards the top of the screen. In the diagram above, the Road sign indicates that the target is front of you. Use the Road sign and Distance info windows to guide you to the target. You need to move toward the target symbol until the distance is zero. As you move closer to the target, the width of the road increases.

When you are on course, the road is displayed vertically on the screen. When you are off course, the road is displayed skewed (at an angle) on the screen. The angle (clockwise or counterclockwise) at which the road is turned depends on how far off course you are.

As you follow the directions in the Info windows and move closer to the target, the Distance decreases and the road width increases. For more information, see Using the Road Tab, page 26-3.

4. When you reach the water faucet, update its attributes as you did for the first water faucet that you revisited. For more information, see Updating the Data, page 9-15.

TIP By default, the Info windows on the Road tab show Distance, Road sign, and Velocity. You can configure the Info Windows (see page 26-9) to suit your application or personal preference.

Data Update

9.3   Creating a Waypoint

While in the field collecting water samples, you come across a fallen tree. Mark it as a waypoint, so that the field crew can navigate back to it and clear the path.

A waypoint is a single position created using the GeoExplorer 3 handheld (in the field) or using the GPS Pathfinder Office software. Use it to record a geographic point of interest that is not part of your data file.

A waypoint is different from a feature (see Glossary-8). No attribute information is recorded for a waypoint (see Glossary-18) and the GPS position is not linked to a data file. Waypoints are primarily used for navigation, and can be transferred to the GPS Pathfinder Office software as a separate waypoint file.

A waypoint has a number, name, latitude, longitude, and altitude. You can use the Option list to create and edit waypoints.

To create a waypoint at your current location:

1.   Press OPTION. The option list appears:

Data Update
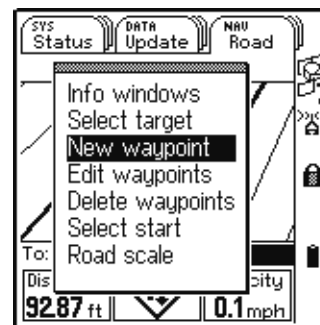
2.   Select New waypoint.

3.   The GeoExplorer 3 automatically names the new waypoint. The
      Name field is already highlighted, so press (ENTER) to change
      the name. Use the Text entry (see page 15-37) field to clear the
   default name and enter **TREE** as the new name for the
      waypoint.

NOTE   If the cursor is active, the waypoint is automatically given the default name,
                  "CursorXXX".

4.   The GeoExplorer 3 automatically assigns your current GPS
      position as the position of the waypoint. Press (CLOSE).

TIP   Waypoints can be created in the office using the GPS Pathfinder Office software. For more
                  information, refer to the GPS Pathfinder Office Help.
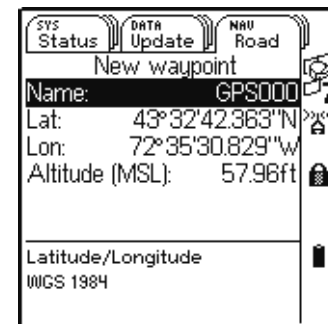
9.4   Closing the File

When you have completed your data update session, turn off the GeoExplorer 3 handheld. To do this, press ⬭. This closes the data file and turns off the GeoExplorer 3 handheld.

Data Update

Data Update

Advanced Functions

10 ADVANCED FUNCTIONS

When using the GeoExplorer 3 data collection system to collect and update data, you can use a variety of advanced functions to provide more accurate and efficient results. The following topics are discussed here:

- Advanced Data Collection, page 11-1
- Carrier Phase Data Collection, page 12-1
- Coordinate Systems, page 13-1

11 Advanced Data Collection

Advanced data collection techniques offer time-saving techniques for efficient data collection. Step-by-step instructions are provided for:

- Advanced Datalogging Options, page 11-2
- Recording Positions Only, page 11-5
- Continuing Line and Area Features, page 11-6
- Segmenting Line Features, page 11-7
- Offsets, page 11-8
- Averaged Vertices, page 11-11
- Repeating Features, page 11-14

11.1   Advanced Datalogging Options

The GeoExplorer 3 data collection system provides three closely-related options for logging GPS data. These options differ in their timing of GPS data collection relative to the start of a feature.

- Before (see page 11-3) – start collecting GPS positions before starting a feature.
- Now (see page 22-2) – simultaneously collect GPS positions and start a feature.
- Later (see page 22-2) – start a feature, then start collecting GPS positions later.

11.1.1 Before

This option is useful when you are using a data dictionary that contains a large number of feature types. For example, if a data dictionary has 50 features and you must scroll through the list to find the feature to record, you can start logging and then select the feature. The GPS positions collected and stored are automatically assigned to the next feature that you select. This means that you can collect extra GPS data while searching for the appropriate feature type.

You can also use the Before option to quickly and efficiently collect the start and end of line features. For example, if you are driving and come to the start of a bridge, press ⬭LOG⬮ to start logging GPS positions. When you reach the end of the bridge, press ⬭LOG⬮ to pause logging. Then scroll through the feature list, select the bridge feature type, and enter the attributes. Press ⬭CLOSE⬮ to close the feature and assign all GPS data that you recorded before starting the feature.

To use the Before option:

1.   Press (DATA) until The New Tab (see page 22-1) is active. Press (LOG). The GeoExplorer 3
       data collection system starts to log GPS positions and the logging icon appears in the Status Bar
       (see page 15-13).

New feature list
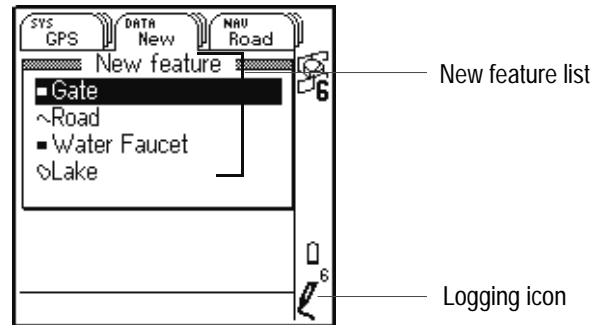
Logging icon

NOTE   When using the Before option, the logging interval used is the minimum configured logging interval
               (for all features). To change the minimum logging interval, select Edit Feature Settings (see
               page 19-61).

2.   To assign the GPS positions to a feature collected using the Before option, select the feature from
       the New feature list. The attribute entry form appears.

3.   Press (CLOSE) to stop logging and store the feature. (Press (LOG) to stop logging if no feature is
       selected.)

11.2   Recording Positions Only

Most of the GPS data you collect with the GeoExplorer 3 data collection system is recorded in files rather than as waypoints. A file lets you store positions continuously. If you do not want to use a data dictionary, you can collect positions in a file without collecting feature and attribute data. Positions are recorded at the minimum logging interval for all features. To change this interval, select Edit Feature Settings (see page 19-61).

Recording just GPS positions is a useful technique in cases where you do not need to record feature and attribute data. A utility company, for example, may want to record a breadcrumb trail of the day's activities. In this case, you would not want to collect feature or attribute information, only the positions.

To record GPS positions only:

1.   Create a new file using The File Tab (see page 21-1).

NOTE   The Dictionary field must have a value. Use the Generic dictionary. The data dictionary selected does not matter as it will not be used.

2.   Press ⬭LOG⬭ to start logging GPS positions.
3.   Press ⬭LOG⬭ to pause logging GPS positions.
4.   Press ⬭CLOSE⬭ to stop logging.

11.3 Continuing Line and Area Features

When recording a line or area feature, you might come across a point feature that you need to record. The point feature may be along the line/area feature, or it may be some distance away. When collecting a path (line feature), for example, you might encounter a gate (point feature). You do not have to record the entire path and then return to record the gate. Simply end the path feature, collect the gate feature, and then use the Continue option to continue the path feature you were collecting.

NOTE   Other Trimble GIS products refer to this functionality as Nesting.

NOTE   You can collect as many point features within a line or area as you want. The number is limited only by storage space in the GeoExplorer 3 handheld.

To use Continue:

1.   Press (CLOSE) to close the line or area feature you are collecting. The New feature list appears.

2.   Select the point feature that you want to collect. The attribute entry form appears and logging starts.

3.   When you have recorded attributes for the point feature and logged sufficient GPS positions, press (CLOSE) to store the feature. The New feature list appears again.

4.   Press (OPTION). From the option list, select Continue <line/area feature name>. The GeoExplorer 3 returns to the attribute entry form for the line or area feature that you were logging before and continues to log GPS positions for that feature.

5.   When you complete the traverse of the line or area perimeter, press (CLOSE) to store the feature.

11.4   Segmenting Line Features

When collecting line features, it is often convenient to divide a line into a number of segments. Segmenting line features allows you to specify different attribute values for parts of the same physical line. You can also end one line feature and immediately start another of the same type, while still moving. This is useful when mapping roads or highways where it is difficult (or illegal) to stop at the point where one feature ends and the next starts.

To segment a line feature:

1. Start collecting the line feature.
2. From the attribute entry form, press (OPTION) and select Segment.

    The current line feature is stored and another line feature of the same type is immediately started with the same attribute values as the previous one. The last GPS position of the first feature is identical to the first GPS position of the second feature, so that adjacent segments join end-to-end in the GIS.

NOTE   When you select Segment, the GeoExplorer 3 validates the attributes of the first line feature. Always complete attribute entry before selecting Segment to store one feature and start another.

CAUTION   If you select Segment and no current GPS position is available (because of poor satellite geometry, for example), the GeoExplorer 3 does not start with the last GPS position of the previous line feature. Instead, the new line feature starts from the first GPS position that becomes available. In this case, a gap occurs between the segments.

11.5   Offsets

If you cannot travel alongside or over the top of a feature, you can enter an offset and record it at the specified distance. When collecting a tree feature, for example, it is typically easier to stand some distance (such as 10 paces to the North) from the tree and record its attributes. This ensures good GPS reception, and lets you see the tree clearly to assess its condition. Specify an offset to the tree of "10 m South". This ensures that the tree is positioned correctly in the GIS. This is an example of an offset point feature.

The attribute entry form for each feature type has an Offset option. Select Offset to view or enter the offset for the feature being collected. For information about configuring constant offsets, see Feature Settings, page 19-60.

You can also use offsets for line and area features. For example, when collecting a line feature such as a fence, it may be easier to drive along the road beside the fence and record the positions of the fence as an offset feature. When collecting an area feature such as a lake, you could walk some distance from the lake edge and record its perimeter using an offset. These examples are shown below:

Line offset
distance

Path traveled
around lake

Area offset
distance
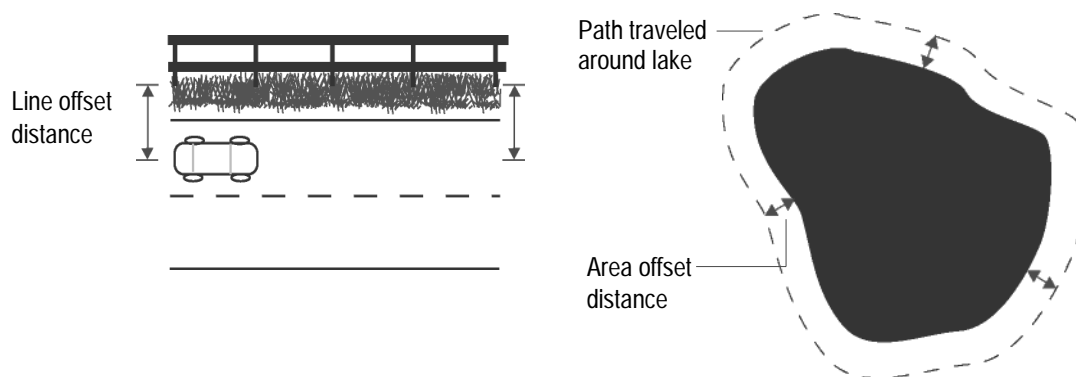
NOTE   Any feature (point, line, or area) can have only *one* offset associated with it. This means that to record a line feature with a given offset and then change the offset during the line feature, you must segment the line at that point. Each segmented line feature has its own offset. To collect an area feature using offsets, the same offset value must apply to the whole area feature. This may require a test run around an object to make sure that you can remain a consistent distance from it.

To offset a feature:

1.   Start the feature.

2.   From the attribute entry form, press ⬭OPTION⬭ and select Offset. An Offset form appears:

```
┌─────────────────────────────┐
│ ⟨SYS   ⟩⟨DATA ⟩⟨NAU  ⟩       │
│  GPS     New    Road         │
│      Offset for Road      ⌐┐ │
│ Direction:          Right ⌐6 │
│ Horz. distance:    0.00m     │
│ Vert. distance:    0.00m     │
│                              │
│                              │
│                          ▯   │
│                          39  │
│                          ⌡   │
└─────────────────────────────┘
```

The fields that appear in the Offset form depend on the type of feature you are collecting (point, line, or area). This example shows the fields for a line or area feature. For a point feature the fields are: Bearing, Horz. distance, and Vert. distance.

3.   Enter a value for each field. Select the field and use the data entry field to enter the value.

4.   When the Offset form is complete press ⬭CLOSE⬭. The attribute entry form reappears.

5.   When you have recorded attributes for the feature and logged sufficient GPS positions, press ⬭CLOSE⬭ to store the feature. The New feature list appears.

NOTE   To remove an offset, press ⬭OPTION⬭ while the Offset form is open and select Reset.

11.6   Averaged Vertices

To record positions with greater accuracy for a line or area feature, you can use the averaged vertex function. An averaged vertex is a group of positions within a line or area feature that are averaged and displayed as a single position. For example, to record a baseball diamond, rather than walking round the entire area logging continuous positions, you can collect an averaged vertex position at home base, move to first base, collect another averaged vertex position, and so on until you have logged all the bases around the diamond.

With the GeoExplorer 3 you also have the flexibility of collecting both normal positions and   averaged vertex positions within a line or area feature. This is useful when a road or park, for example, is made up of both straight and curved parts.

Once collected and saved, an averaged vertex is converted to, and displayed as, a single position. It is also exported as a single position, although you can view and edit the individual positions that make up the vertex in the GPS Pathfinder Office software. For more information, refer to the GPS Pathfinder Office Help.

You can record an averaged vertex at any time. For example, if the line or area feature has both curved and straight parts, you can begin logging continuous positions and then record averaged vertices, or vice versa. Both methods are described below.

To log a feature starting with an averaged vertex:

1. Select Later, page 22-2 as the logging mode. (If Now, page 22-2 is selected, logging begins immediately in continuous mode, and normal positions, rather than averaged vertices, are recorded.)

1. Start the area or line feature from the New feature list on The New Tab (see page 22-1).

2. Press (OPTION) and follow the instructions below, beginning with Step 2.

To continue logging a feature but record an averaged vertex:

1. In The New Tab (see page 22-1), press (OPTION).

2. Select New vertex from the list and press (ENTER).
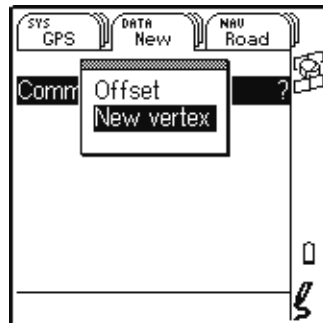
A Vertex form for the feature appears, and logging starts immediately.

While an averaged vertex is being logged, the messages `Vertex open` and `Remain stationary` are displayed.

Remain stationary

Logging
averaged
vertex icon
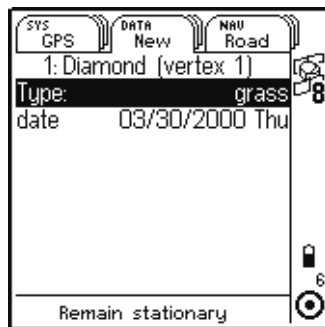
The number of positions recorded for the current vertex is shown in the status bar, above the logging averaged vertex icon (⊙).

3. Press (CLOSE) to accept and save the vertex, and return to the feature form.

When the vertex is saved, the `Vertex stored` message is displayed. For each averaged vertex you want to record, repeat the appropriate steps above.

TIP Press (Fn)(CLOSE) to abandon the current vertex. The positions logged for the vertex are abandoned but any attribute information is retained.

11.7   Repeating Features

Using Repeat lets you efficiently record a sequence of similar features because you do not have to re-enter values for all attributes. Simply check that each attribute value is correct for the selected feature and change only those that need to be changed.

When you use Repeat, attribute values are copied from the last recorded feature of that type. Any default attribute values specified in the data dictionary are overwritten by repeated values.

To Repeat attributes for similar features:

1.   When the New feature list is active, press (OPTION), select Repeat and press (ENTER). A ✓ appears in the check box. Press (CLOSE) to close the option list.

2.   Select a feature from the New feature list. The attribute form appears. The attribute values that appear are those of the last recorded feature of that type. Edit them if necessary. Press (CLOSE) to save the attribute values and store the feature.

3.   Select another feature. Continue until you want to turn off the Repeat mode.

To turn off the Repeat mode:

•   Press (OPTION), select Repeat and press (ENTER). The ✓ disappears.

NOTE   When Repeat is not selected, default attribute values are determined by the data dictionary. The data dictionary specifies a default value for each attribute belonging to a feature where appropriate.

12 Carrier Phase Data Collection

To collect a feature with a precision better than regular GPS data, configure the GeoExplorer 3 data collection system to log carrier phase data.

The following topics introduce you to the basic concepts and then describe in detail how to collect and use carrier phase data.

- Before You Begin, page 12-2
- Configuring the GeoExplorer 3 Data Collection System, page 12-13
- In the Field, page 12-16
- Back in the Office, page 12-21

12.1 Before You Begin

The following topics discuss some of the concepts associated with using carrier phase data.

- Why Use Carrier Phase Data?, page 12-3
- Planning, page 12-3
- Collecting Sufficient Data, page 12-3
- Time, page 12-5
- Recording Features, page 12-10
- Postprocessing, page 12-12

12.1.1 Why Use Carrier Phase Data?

In a conventional GPS session, the GeoExplorer 3 logs independent GPS positions. If enough satellites are visible and the geometry is good, it continues to log reliable positions.

When the GeoExplorer 3 also logs carrier phase data, positions collected in the field can be further postprocessed to generate more precise positions once you are back at the office. Because measurements are collected from each individual satellite, the positions generated during postprocessing are *more precise* than positions logged in the field.

12.1.2 Planning

You require a clear view of the sky at all times when collecting carrier phase data, so avoid obstacles such as trees, bridges, and tall buildings. Choose a time of day when you can expect to track a maximum number of satellites with the best possible geometry.

NOTE   Always make sure that you collect *sufficient useful data* while in the field.

12.1.3 Collecting Sufficient Data

Always make sure that at least four satellites remain visible for enough time to provide sufficient useful data for postprocessing.

Number of satellites

To provide sufficient carrier phase data to achieve the required precision, the GeoExplorer 3 data collection system needs to log data from at least **four** satellites for the required minimum time. However, you will need to log data from at least five satellites before the postprocessing software can compute the precision of the generated positions. The five satellites together provide the necessary redundancy for the precision required, but you can use more.

"Loss of lock" occurs when the number of available satellites drops below four.

NOTE   If you minimize the number of times that loss of lock occurs during a session, you greatly increase the precision of the postprocessed results.

When you start a file that has any features configured to carrier, the GeoExplorer 3 data collection system starts to record carrier phase data. As soon as four or more satellites are available, a counter starts. When the minimum time has elapsed, all of the carrier phase data recorded during **that** period can be used during postprocessing.

12.1.4 Time

The minimum time for which four or more satellites must be available is 10 minutes. The Differential correction software will not process data blocks less than 10 minutes in length.

Counter

A counter in the GeoExplorer 3 handheld starts to measure time as soon as four or more satellites are available.

When the counter reaches the minimum time, a message is displayed in the message box. It indicates that the current "block" contains ***sufficient*** useful data.

If you lose lock before the end of the minimum time, the data collected until then may not provide the required precision during postprocessing. Consequently, the counter is automatically reset to zero when loss of lock occurs. It only restarts when lock is regained.

NOTE   The counter is active ***only*** if the GeoExplorer 3 is logging carrier phase data from four or more satellites—it does not simply record the time that has elapsed since the beginning of the file.

Time and precision

The precision of positions generated during postprocessing depends on a combination of the number of satellites used, the distance between base and rover, and the period of time for which data is recorded from those satellites. Collecting data for longer generally gives more precise positions.

Assuming that enough satellites are available, the following figure shows the relationship between the time taken to collect carrier phase measurements and the precision of the positions generated during postprocessing.
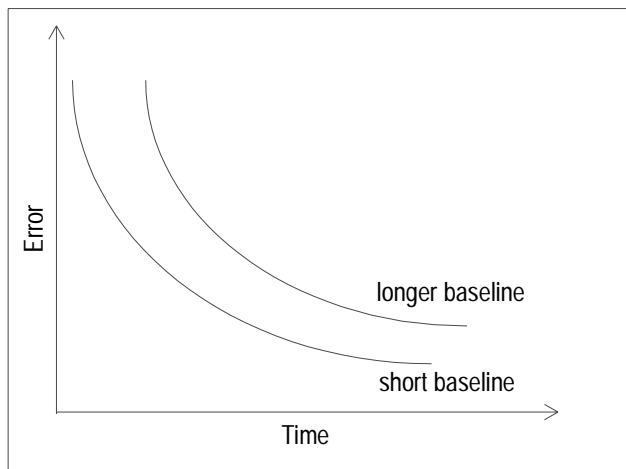
What is a "block" of data?

When you start a file that has any features configured to carrier, the GeoExplorer 3 handheld starts to record carrier phase measurements. Useful data is not stored as one continuous stream, however, but as a series of "blocks".

The beginning and end of each block is determined by the number of available satellites. As soon as four (or more) satellites are available, a new block begins. This block continues until lock is lost. When lock is regained, a new block begins.

The GeoExplorer 3 continues to create blocks of data throughout the file. These blocks together constitute the measurement data for the entire session.

Opening and reopening files

The files that you create in the GeoExplorer 3 are independent of each other, so carrier phase data collected in one file is of no use to another.

If you use the GeoExplorer 3 to collect carrier phase data, you need to collect sufficient data *every* time you open a file—this is true whether you open a new file or reopen an existing one. Always make sure that you collect sufficient data for each file.

The figure below shows how the GeoExplorer 3 creates distinct blocks of carrier phase data as the number of satellites changes.
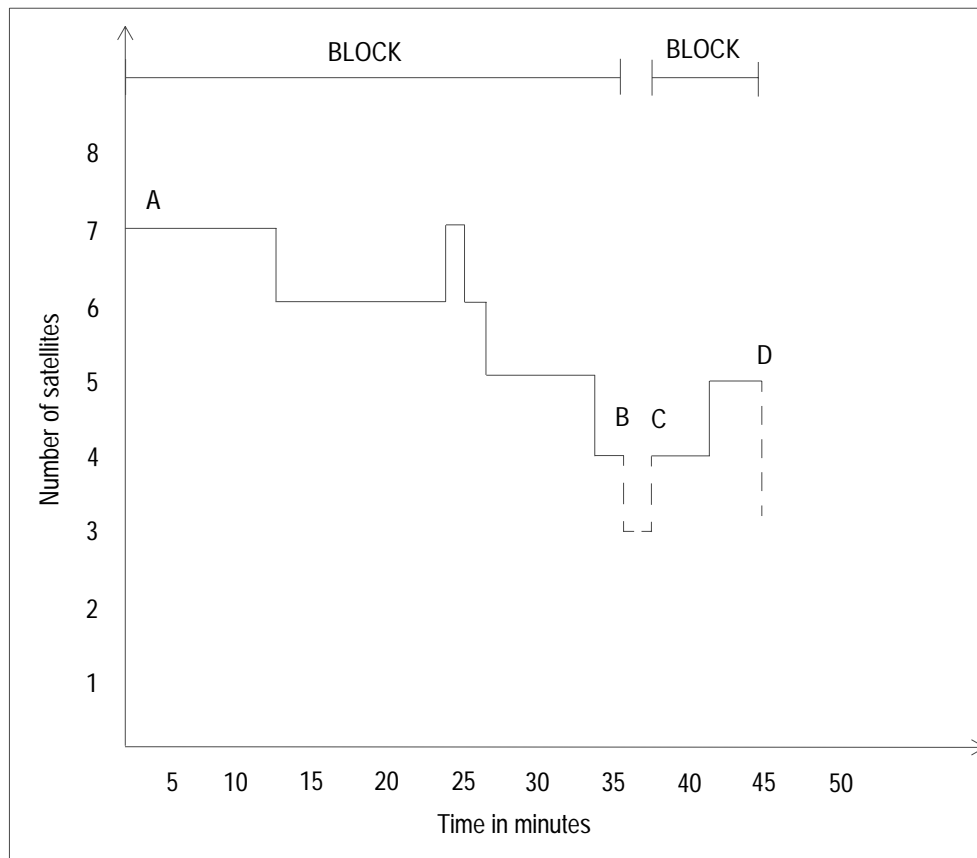
A = 4 or more satellites – useful carrier phase data

B = lock is lost – unusable carrier phase data

C = lock is regained (4 or more satellites) – useful carrier phase data

D = lock is again lost – unusable carrier phase data

In the previous figure, the counter begins at time zero and stops at 35 minutes when lock is lost (B). This creates the first block of carrier phase data. The minimum time required for the differential correction utility to process carrier phase data successfully is 10 minutes, so the first block contains sufficient useful data. The longer the blocks are in time, the greater the precision achieved.

Between B and C, the required minimum number of satellites is not met. The counter does not start, and the carrier phase data collected during this period is not used.

When four satellites are again available (C), the GeoExplorer 3 creates a new block and the counter begins to measure again from time zero. In this example, this happens 38 minutes after the start of the session. Lock is lost again at 45 minutes (D), after 7 minutes worth of data has been collected. Since the required minimum time is 10 minutes, this block does not contain sufficient continuous data.

12.1.5 Recording Features

While the GeoExplorer 3 data collection system collects carrier phase measurements in the background, you start to record features—these can be points, lines, or areas.

Decide carefully when to start and stop recording feature data. Look for obstructions (such as trees) that may affect the ability of the GPS receiver to maintain lock or sufficient satellites.

Before starting the first feature in a file, wait until four or more satellites are available. Once carrier phase data from at least four satellites is received, the GeoExplorer 3 counter starts.

Ending a feature before minimum time is reached

Once the counter is running, you can choose to end the feature and stay where you are until the minimum time is up. When the minimum carrier time is achieved, you can move to the next feature. Using this method, you can make sure that you have sufficient data to generate precise positions.

Alternatively, if you think you are unlikely to lose lock, you can move to the next feature *before* sufficient carrier phase data is collected.

As long as a block eventually contains sufficient useful data, you can generate precise positions for any feature that falls within it.

This figure shows how individual features benefit from blocks of carrier phase data stored at the time they were recorded.
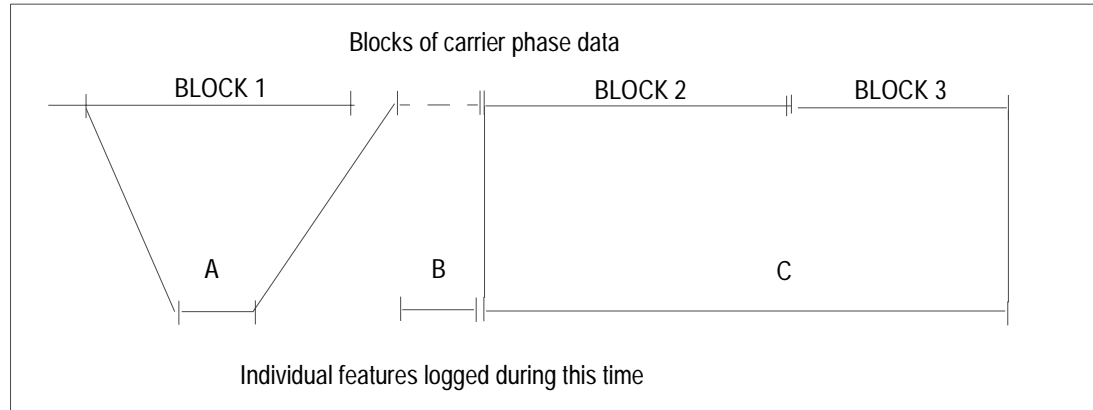
In this example, Block 1 contains sufficient carrier phase data. Feature A was started after the counter started for Block 1 and ended before the success beep, but during postprocessing it derives the full benefit of all data recorded for Block 1.

Feature B was unwisely recorded during a period when no useful data was recorded. You probably need to record this feature again.

Feature C was started when the counter started for Block 2. Logging to this feature continued after the minimum carrier time was achieved. Then there was a loss of lock and a new block of carrier phase data started. The feature was ended before the minimum carrier time was achieved for this block of data, and the file was closed. In this case, the portion of the feature collected before the loss of lock occurred (indicated by the end of Block 2) should achieve the desired precision. However, the second portion of the data, associated with Block 3 may not achieve the desired precision.

CAUTION   Move to the next feature before the minimum time is up only if loss of lock is unlikely.

As you record features, be aware of the following:

- the number of satellites available
- the position of these satellites—if they are to stay visible, they should be high rather than low on the horizon
- any obstruction likely to cut off your view of the satellites as you move

Read any messages that appear in the message box. They indicate how useful the current data is. The message box also shows if loss of lock has occurred, so you can measure that feature again if necessary. If it is clear that a block contains insufficient data, recapture any features that are affected before leaving the site.

12.1.6 Postprocessing

Postprocess all data using an office computer running the Differential Correction utility of the GPS Pathfinder Office software.

In addition to carrier phase data, the GeoExplorer 3 data collection system also logs code phase data in the field.

During postprocessing, the Differential Correction software uses the carrier phase data to generate positions of high precision. It computes positions, and stores these results over the top of the code phase data. The code phase data simply assists with the arrangement of the new positions.

Finally, the software computes the estimated precision of the generated positions. This helps you to evaluate the GPS results.

12.2   Configuring the GeoExplorer 3 Data Collection System

If you decide to use carrier phase data, configure the GeoExplorer 3 data collection system as follows:

1.   Decide which features you want to collect using carrier phase data collection.

2.   Press ⬭ SYS ⬭ until the Setup tab is active.
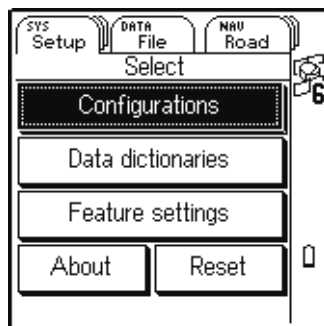
3.   Select Feature settings. The Select feature settings list appears.

Carrier Phase Data Collection

4. Select the name of the data dictionary to be using during the carrier phase data collection session. The Edit feature settings screen appears:

NOTE   This list shows all features contained in the selected data dictionary. The specified logging interval for each feature is also shown.
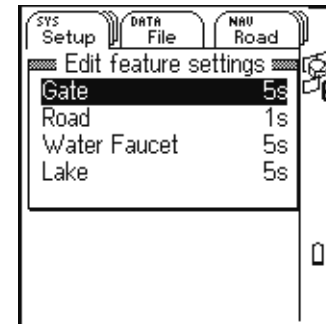
5. To configure an individual feature, select it from the list. The corresponding <feature> settings form appears:

NOTE   Use this form to edit the logging interval and minimum number of positions required, and to change the accuracy.

By default, the accuracy is set to Code. Change this to Carrier. Press CLOSE to close the form and save all changes.
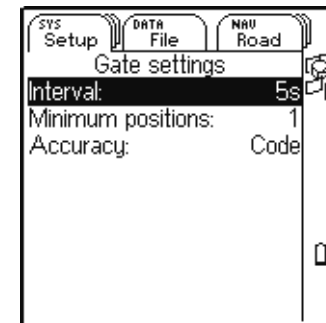
6. Press (OPTION) to configure all points, all lines, or all area
   features. The Edit feature settings option list (see page 19-71)
   appears:

NOTE   Use these options to make the same change to all features of a particular
            type.

Select one of the options. The corresponding Set all <feature
type> form appears. By default, the accuracy is set to Code.
Change this to Carrier. Press (CLOSE) to close the form and
save all changes.

You are now ready to go into the field and collect carrier phase
data.

TIP   To close a form without saving the changes, press (Fn)(CLOSE).
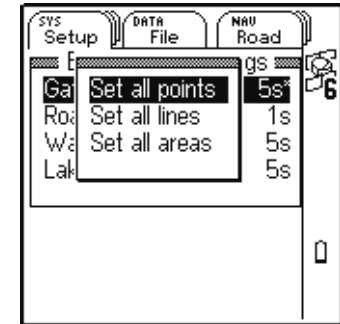
12.3   In the Field

The techniques used when collecting carrier phase (see Glossary-4) data are slightly different from those used when collecting code phase (C/A code) (see Glossary-4) GPS positions. A carrier phase data collection session includes the following tasks:

- Opening a new file using The File Tab, page 21-1
- Collecting Carrier Phase Data, page 12-17

12.3.1 Collecting Carrier Phase Data

When a data file is open, the New feature list appears:
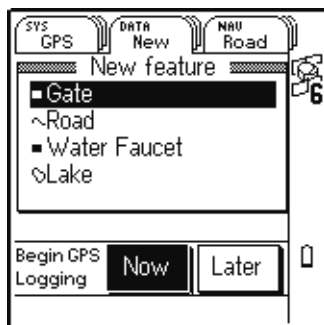
Features in this list are determined by the data dictionary specified when the file was created.

To collect carrier phase data:

1. Start a feature by selecting it from the New feature list. If the feature is configured for carrier, the GeoExplorer 3 begins logging carrier phase data. The `Carrier started` message appears briefly in the message box.

NOTE The logging icon will change to the carrier phase logging icon when carrier phase logging starts.

2. Check the carrier time. As you log carrier phase data, the GeoExplorer 3 displays the time elapsed since the current block of data started. This is referred to as "carrier time". The carrier time appears in the message box at the configured feature logging interval and shows, in minutes and seconds, the amount of data collected.
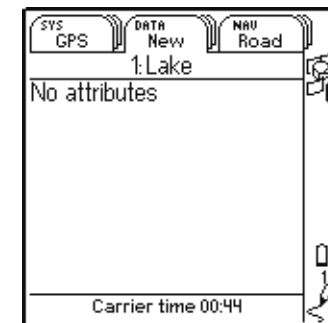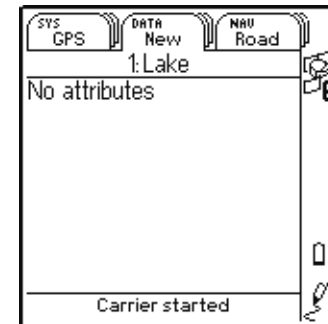
3.   Stay at the feature until you have logged carrier phase data continuously for at least 10 minutes. The `Carrier time achieved` message appears in the message box to indicate that 10 minutes of continuous carrier data has been recorded.
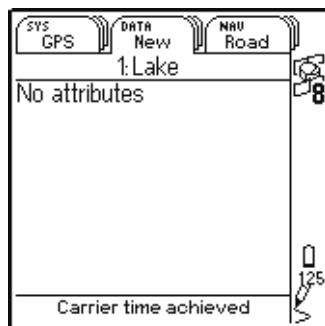
This means you have logged sufficient carrier data in the current block. All positions in this block can be carrier phase processed in the GPS Pathfinder Office software.

4.   Press (CLOSE) to close the feature and save the carrier phase data.

NOTE   Trimble recommends that you occupy the first feature for the full time before moving on to other features. For more information, see Ending a feature before minimum time is reached, page 12-10.

5.   Repeat Steps 1 through 4 for the next feature.

6.   When you are finished collecting features, press (CLOSE) to close the file.

If you try to close the file before the minimum time is up, the GeoExplorer 3 asks for confirmation that you want to close the file.
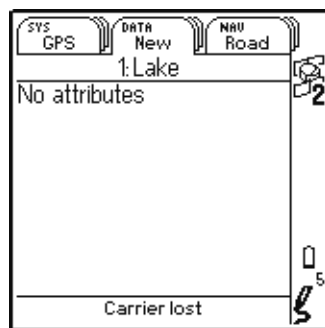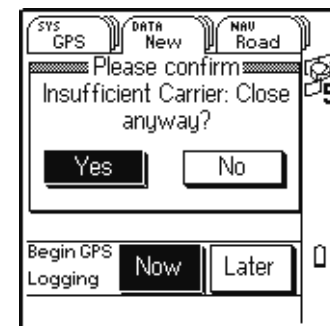
While you are logging carrier phase data, the GeoExplorer 3 warns you whenever the GPS receiver loses lock. The `Carrier lost` message appears in the status line. The counter is reset and the `Carrier time` message shows 00:00.

In addition, the GeoExplorer 3 writes a note to the data file every time the counter is reset. This records when the carrier time was reset. Review this note back at the office using the GPS Pathfinder Office timeline.

If the minimum time is not reached, you can choose whether to reoccupy the affected features or move on. If you move on, the affected feature is unlikely to achieve the carrier precision.

12.4   Back in the Office

To transfer data from the handheld to the office computer, place the GeoExplorer 3 handheld in the GeoExplorer 3 Support Module (see page 3-11) and use the Data Transfer utility that is part of the GPS Pathfinder Office software.

Process the files using the GPS Pathfinder Office Differential Correction utility. For instructions on processing data files, refer to the GPS Pathfinder Office Help.

13 Coordinate Systems

When using the GeoExplorer 3 data collection system to collect GPS data, you can configure the coordinate system, zone, and datum. This lets you enter and display coordinates using the coordinate system that best suits you and the location you are working in. The following topics are discussed:

- Coordinate Systems and Datums, page 13-2
- Coordinate Systems Available on the GeoExplorer 3 Data Collection System, page 13-6
- Using Coordinate System Manager, page 13-7
- Transferring Coordinate Systems, page 13-8
- Configuring Coordinate Systems, page 13-11
- Resetting Coordinate Systems, page 13-12

NOTE   Transferring of coordinate systems is not available with the GeoExplorer 3c Edition (see page 2-5).

13.1 Coordinate Systems and Datums

Coordinate systems are three-dimensional reference frames used to describe the location of objects in space. The GeoExplorer 3 data collection system provides you with your position anywhere on the earth's surface in relation to the coordinate system you have configured.

Before you can compare geographic data obtained from different sources, the data must be referenced to the same datum (see Glossary-5) and coordinate system. This is because different datums and coordinate systems provide different coordinate values for a single geographic location.

GPS positions are normally expressed as latitudes and longitudes relative to a mathematical model called a datum. The datum used by GPS is called the World Geodetic System 1984 datum (or WGS-84). A datum is defined by the relationship between an ellipsoid (see Glossary-7) and an origin point. An ellipsoid is a three-dimensional surface shaped like a squashed sphere, which approximately models the shape of the earth (either as a whole, or over a particular part of the earth). The WGS-84 datum is defined in terms of the GRS80 ellipsoid.

For most land-based GPS applications, and particularly for GIS data capture applications, latitudes and longitudes are much less convenient. Typically, a GIS will represent the coordinates of geographic features in a locality of interest using a rectangular grid (running North and East) and will presume that the earth is locally flat. A local ellipsoid can be defined to provide a good approximation to the shape of the earth in that locality. A datum transformation and a map projection are then used to transform coordinates from this local ellipsoid to the GIS's flat-earth model.

Heights can be displayed by the GeoExplorer 3 relative to either a local ellipsoid, or an empirically defined surface known as the geoid (see Glossary-9). The geoid is a surface over which the earth's gravity is constant. (The geoid represents mean sea level.)
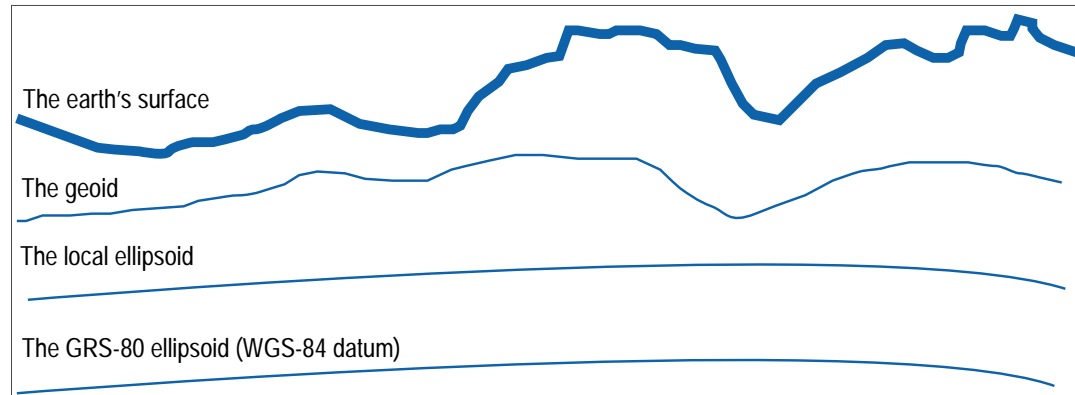
In summary, there are three models for describing geographic locations:

- the flat North, East model of the GIS, possibly with heights as well
- the curved local ellipsoid, used by the GIS as a model of the earth's surface locally
- the curved GRS-80 ellipsoid, used by GPS as a model of the earth's surface as a whole

These models can describe heights as being relative to either:

• an ellipsoid (see Glossary-7)

or

• the geoid (see Glossary-9) (mean sea level)

In order to collect the positions of features using GPS (and hence the WGS-84 datum) and then send them to a GIS as North, East coordinates, the GPS latitudes and longitudes need to be processed in a number of ways.

They need to be transformed from latitudes, longitudes, and altitudes on the WGS-84 datum into latitudes, longitudes, and altitudes on the local datum. This operation is called a datum transformation.

Once the coordinates are expressed as latitudes and longitudes on the local datum, they must then be projected into North and East values on a flat grid, using an operation called a map projection. Finally, if altitudes are to be stored by the GIS, they need to be transformed from heights above the GRS-80 ellipsoid to heights above some other reference level. The most common reference level is the geoid, more commonly referred to as mean sea level. The GeoExplorer 3 data collection system and the GPS Pathfinder Office software both contain a geoid separation model which enables them to transform altitudes relative to GRS-80 into heights relative to mean sea level.

The geoid separation models used by the GeoExplorer 3 and the GPS Pathfinder Office software differ in accuracy. The GeoExplorer 3 is necessarily approximate, while GPS Pathfinder Office is more accurate. If you require altitudes relative to a different reference level, or relative to a more accurate (perhaps local) mean sea level mode, you will need to process the heights in the GPS Pathfinder Office software before exporting them to your GIS.

The GeoExplorer 3 lets you specify a datum transformation and a map projection, so that you can see your GPS position (and the position of features you may have recorded) in your local coordinate system. This makes it easy for you to check your position or navigate using a map produced by your GIS. It also allows you to specify that heights will be shown relative to your local ellipsoid, or relative to mean sea level.

For your convenience, the GeoExplorer 3 data collection system bundles up the complexities of datum transformations and map projections, and hides these complexities behind the common names for the coordinate systems with which you may be familiar. Each named coordinate system has an associated datum (which encapsulates an ellipsoid) and a number of zones (each of which is a named instance of a particular map projection).

You can create your own coordinate systems and sites using the Coordinate System Manager utility program in the GPS Pathfinder Office software. With the set of pre-defined coordinate systems supplied by Trimble this should rarely be necessary.

13.2 Coordinate Systems Available on the GeoExplorer 3 Data Collection System

The GeoExplorer 3 and GeoExplorer 3c data collection system are supplied with two coordinate systems:

- Lat/Long – latitude, longitude, and height (above Mean Sea Level or Height Above Ellipsoid)
- UTM – northing, easting, and elevation

There are also over 100 datums already on the GeoExplorer 3. Most National Coordinate Systems are supported, and you can easily load these using the Data Transfer utility in the GPS Pathfinder Office software.

NOTE   You cannot use local sites.

NOTE   The default geoid on the GeoExplorer 3 is the DMA 10x10 (Global) model. This is different from the default used by the GPS Pathfinder Office software. As a result, MSL heights on the GeoExplorer 3 may differ to those displayed in the GPS Pathfinder Office software.

NOTE   You cannot load coordinate systems from the GPS Pathfinder Office software to a GeoExplorer 3c edition.

13.3   Using Coordinate System Manager

Use the Coordinate System Manager utility, in the GPS Pathfinder Office software, to create and edit custom coordinate systems for use with the GeoExplorer 3.

To use Coordinate System Manager:

1.   On the office computer, start the Coordinate System Manager utility from GPS Pathfinder Office.

2.   Use the tabs in the main window to select or edit coordinate systems and zones.

3.   Export the coordinate system database file. Select File/Export.

     The Export dialog appears.

4.   Select the Select records only option in the Export dialog.

5.   Click **OK**.

     The Save As dialog appears.

6.   Specify the new file name and click **Save**.

When you have saved the coordinate system database files, and the related support files, use the Data transfer utility to transfer the coordinate system files to the GeoExplorer 3.

For more information, refer to the GPS Pathfinder Office Help.

13.4   Transferring Coordinate Systems

Use the Data Transfer utilities, in the GPS Pathfinder Office software, to transfer coordinate systems and grid files between the GeoExplorer 3 data collection system and the office computer.

To transfer coordinate systems and grid files:

1. Place the GeoExplorer 3 handheld in the support module. Make sure that the support module is connected to the office computer. Once the GeoExplorer 3 is in the GeoExplorer 3 Support Module (see page 3-11), it is ready to transfer data files.

2. On the office computer, start the Data Transfer utility from the GPS Pathfinder Office software.

    The Data Transfer dialog appears.

3. From the Device list, select the device name that represents the GeoExplorer 3 handheld.

    You can use one of the predefined names (GIS Datalogger on COM 1 or GIS Datalogger on COM 2, depending on which serial (COM) port the support module is connected to), or you can set up a new device definition for your GeoExplorer 3 handheld.

    The Data Transfer utility automatically connects to the GeoExplorer 3 handheld.

4. Select the Send tab.

5. Click **Add** and select the appropriate file type in the Data Type field. In this case, select Coordinate System, Coordinate System Export File or Grid File.

    *   If you selected Coordinate System from the Add list, select the correct System and Datum in the Coordinate System dialog, and click **OK**.

    *   If you selected Coordinate System Export File or Grid File, the Open dialog appears where you can browse for the file. By default, the last folder used to transfer (send) a file is shown. Select the file and click **Open**.
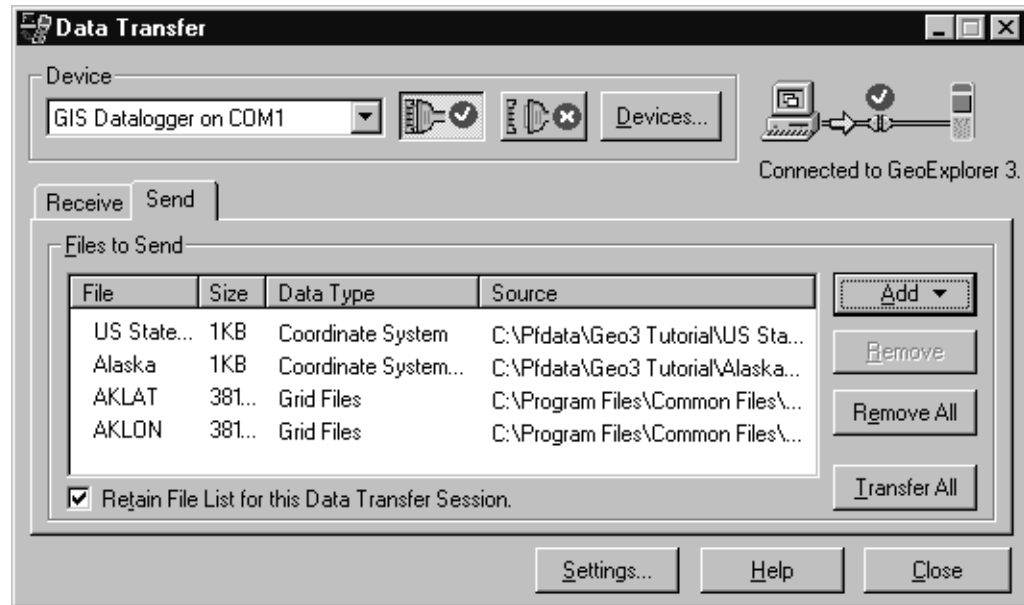
6. The file you selected is added to the Files to send list in the Data Transfer dialog.

7. Click **Transfer All**. All files in the Selected Files field are transferred. (When the size of the file(s) is greater than 200 KB, you are prompted to confirm the transfer, as it will use up a considerable portion of the data collector's memory.)

NOTE   You can also use the Configuration Manager utility to specify which zone is to be transferred to the GeoExplorer 3 data collection system. The Configuration Manager can only transfer one zone. If you specify a zone and transfer this configuration, the appropriate Coordinate System Export file (.CSE file) is also transferred. Use the Coordinate System Manager utility to transfer more than one zone.

For more information, refer to the GPS Pathfinder Office Help.

NOTE   The GPS Pathfinder Office software contains pre-defined CSE files containing coordinate systems for a number of regions of the world. For example, America.CSE contains all the coordinate systems for the Americas. Using the Data Transfer utility, select Coordinate system in the Data Type drop-down menu to display a list of pre-defined coordinate system files.

13.5   Configuring Coordinate Systems

You can use the Coordinates form to edit the coordinate system, zone, and datum parameters. The GeoExplorer 3 data collection system lets you specify a datum transformation and a map projection so that you can see your GPS position, and the position of features you collect, in your local coordinate system. This makes it easy for you to check your position or to navigate using a map produced by your GIS.

To configure the Coordinates form:

1.   Press ⬭SYS⬭ until the Setup tab is active.

2.   Select Configurations. The Edit configuration screen appears.

3.   Select Coordinates. The Coordinates form appears:

Use this form to specify the coordinate system, zone, datum, altitude reference, and geoid. You can also specify the units used to display the coordinates and altitude. For more information, see Coordinates, page 19-25.

13.6   Resetting Coordinate Systems

You can remove the transferred coordinate systems from the GeoExplorer 3. To do this reset the list of coordinate systems. All coordinate systems, except Latitude/Longitude and UTM, are removed.

To reset the list of coordinate systems:

1.   Press ⬭SYS⬭ until the Setup tab is active.

2.   Select Configurations.

     The Edit configuration screen appears.

3.   Select Coordinates. The Coordinates form appears:

4.   Highlight the System field and press ⬭OPTION⬭.

5.   Select Reset coordinate systems. You are prompted to confirm the reset.

6.   Select Yes to remove the coordinate system file from the GeoExplorer 3. Latitude/Longitude becomes the new current system. Select No to cancel the reset operation.

NOTE   You cannot delete Latitude/Longitude or UTM from the list.
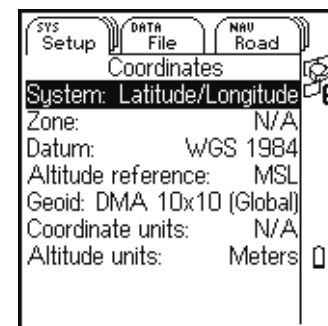
Reference

14 REFERENCE

This Reference provides detailed information about screens that appear when you use the GeoExplorer 3 data collection system.

General Operation (see page 15-1) describes different ways to interact with the GeoExplorer 3. It also explains how to use the keys and screens. Other topics correspond to different areas of the software.

The GeoExplorer 3 software is arranged in three "sections":

- THE SYS SECTION, page 16-1
- THE DATA SECTION, page 20-1
- THE NAV SECTION, page 25-1

Reference

15 General Operation

This section contains detailed information about the GeoExplorer 3 user interface and data entry methods. The topics covered are:

- Turning the GeoExplorer 3 Handheld On and Off, page 15-2
- Adjusting the Display, page 15-3
- Rebooting the GeoExplorer 3 Handheld, page 15-4
- GeoExplorer 3 Menu Structure, page 15-6
- The GeoExplorer 3 Display, page 15-12
- Status Bar, page 15-13
- Interacting with the GeoExplorer 3 Data Collection System, page 15-19
- Password Control, page 15-49

General Operation

15.1   Turning the GeoExplorer 3 Handheld On and Off

This explains how to turn the GeoExplorer 3 handheld on and off.

15.1.1 On

To turn on the GeoExplorer 3 handheld, press ⬭ (the On/Off key). A Trimble identification screen appears for a few seconds while the GeoExplorer 3 performs a self-test. This is replaced by the GPS tab. The GeoExplorer 3 data collection system always returns to the GPS tab when turned on.

15.1.2 Off

To turn off the GeoExplorer 3 handheld, press and hold ⬭ (the On/Off key) for one second.

15.2   Adjusting the Display

This explains how to adjust the screen contrast and backlight mode.

- Backlight, page 15-3
- Screen Contrast, page 15-3

15.2.1 Backlight

The GeoExplorer 3 handheld displays information on an LCD screen. The screen is easiest to read when viewed directly from the front.

The screen can be backlit to make viewing easier in poor light conditions. The backlight is always off when the GeoExplorer 3 is turned on. The backlight can be changed to one of three states by pressing ⟨Fn⟩ ⟨DATA⟩. The states are Off, Normal, and Bright. When the backlight is in the normal or bright state, an icon appears in the status bar (see page 15-13).

CAUTION   Operating the backlight uses more power.

15.2.2 Screen Contrast

Depending on viewing conditions, you may need to adjust the screen contrast. To lighten the screen contrast, press ⟨Fn⟩ ⟨NAV⟩. To darken it, press ⟨Fn⟩ ⟨SYS⟩.

General Operation

15.3 Rebooting the GeoExplorer 3 Handheld

If the GeoExplorer 3 handheld locks up and does not respond to key presses you need to perform a warm boot. This causes the GeoExplorer 3 hardware to shut down.

NOTE Whenever possible, before rebooting, transmit any data in the GeoExplorer 3 handheld to an office computer.

15.3.1 Warm Boot

To perform a warm boot on the GeoExplorer 3, press ⬭ and hold down for 10 seconds. The GeoExplorer 3 turns off. Press ⬭ again to turn it on.

NOTE This procedure causes the GeoExplorer 3 hardware to perform a warm boot. No data loss should occur as a result of performing this procedure.

15.3.2 Cold Boot

To perform a cold boot, turn the GeoExplorer 3 handheld on. The Trimble logo starts spinning. While the logo is spinning, press (ENTER) and (DATA) simultaneously.

NOTE   Once the logo stops spinning and the first screen is displayed, it is too late to attempt a cold boot. Repower the unit and try again.

WARNING   This procedure clears the memory of the GeoExplorer 3. It will remove any data file, configurations, data dictionaries, waypoints, or coordinate systems you may have loaded onto the GeoExplorer 3.

General Operation

15.4   GeoExplorer 3 Menu Structure

The GeoExplorer 3 firmware is arranged in three sections: SYS, DATA, and NAV.
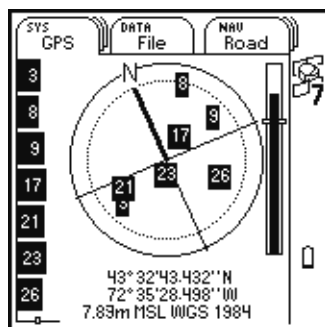
To move to a section, press the corresponding key on the GeoExplorer 3 handheld. For example, to move from the SYS section to the DATA section, press DATA.

Within each section are three tabs that appear at the top of the screen. To move between tabs, press the corresponding section key: SYS, DATA, or NAV. Each time you press the same section key, you move to another tab in that section. For example, to move between the three different tabs in the SYS section, press SYS three times. As you move between the SYS tabs (GPS, Status, and Setup), the current tab moves to the front. Alternatively, you can use the main menu to move between sections and tabs.

15.4.1 Main Menu

Use the Main menu to move around the system and view sections and their corresponding tabs. Press Fn OPTION to display the Main menu.

DATA tabs

NAV tabs

Current tab

SYS tabs

Section keys
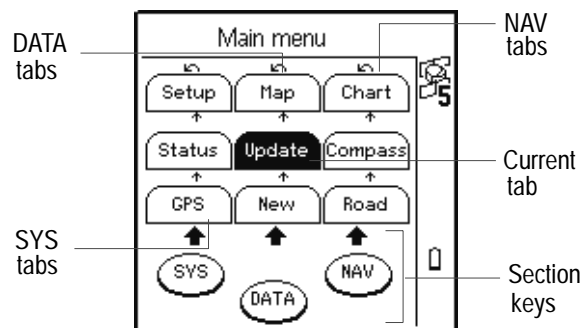
Use the arrow keys to move around the Main menu. The currently active tab is highlighted. Press ENTER to close the Main menu and go to the current tab.

For example, to move from the Chart tab to the Status tab, use the arrow keys to highlight the Status tab and then press ENTER.

NOTE   When no data file is open, the only tab available in the DATA section is File. When a data file is open, the New, Update, and Map tabs are all available.

NOTE   The Map and Chart tabs are not available in the GeoExplorer 3c edition.

15.4.2 Section Tabs

This table summarizes each of the tabs:

	Use this tab …	to …
SYS	GPS	view information about the satellites that the GeoExplorer 3 is tracking and their relative positions in the sky, and to see your current position.
	Status	view information about the GeoExplorer 3 hardware, accessories, and external connections.
	Setup	create and edit data dictionaries and feature settings. Also, use this tab to edit the configuration. You can reset the GeoExplorer 3 data collection system to the factory defaults.
DATA	File	create a new data file or open an existing one.
	New	collect new features and attributes.
	Update	update features and attributes.
	Map	view features and select them for update.
NAV	Road	navigate to features and waypoints using the Road.
	Compass	navigate to features and waypoints using the Compass.
	Chart	navigate to features and waypoints using the Chart.

15.4.3 GeoExplorer 3 Section Structure

The next three diagrams provide an outline of the GeoExplorer 3 menu structure. Use them as a handy reference until you are familiar with the structure.

DATA

FILE tab —— OPTION

NEW tab   UPDATE tab   MAP tab   Rename   Delete   Base
                                                 file(s)   file(s)   Station

                                                            OPTION   OPTION

New feature list   Update feature list   OPTION

Attribute   OPTION   Attribute   OPTION
entry form   entry form

              Repeat   Continue   OPTION   (Un)Delete Sort   Filter   Search Position/ Set/Clear
                        line/area   Summary   Target

OPTION   Menu   Numeric   Text   Date & Time   OPTION OPTION
            entry entry   entry entry

                   OPTION OPTION   OPTION   Zoom Zoom Zoom   Pan/   Delete Filter   Search Layers Set/Clear
Offset   Segment   New   in   out   extents Select   Target
                   vertex
                                                                            OPTION OPTION
OPTION

NAV

ROAD tab   COMPASS tab   CHART tab

OPTION   OPTION   OPTION

ROAD tab branch:

Info windows | Select target | New waypoint | Edit waypoints | Delete waypoints | Select start | Road scale

OPTION   OPTION   OPTION

CHART tab branch:

Zoom in | Zoom out | Zoom extents | Info windows | Pan/Select

Select target | New waypoint | Edit waypoints | Delete waypoints | Select start | Layers

OPTION   OPTION   OPTION

COMPASS tab branch:

Info windows | Select target | New waypoint | Edit waypoints | Delete waypoints | Select start | Calibration

OPTION   OPTION   OPTION

General Operation

15.5   The GeoExplorer 3 Display

Some common displays are shown here to describe features of the GeoExplorer 3 display.
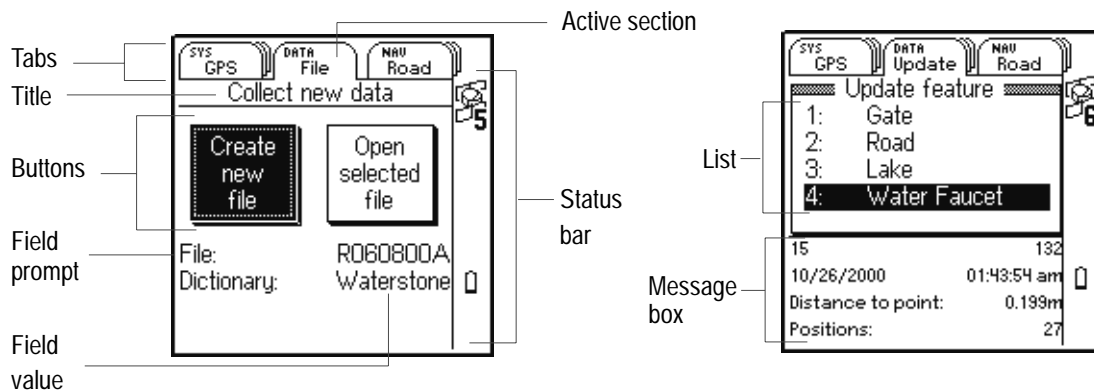
15.6   Status Bar

The status bar is the area of the display on the right. It is always visible. The icons displayed depend on what you are doing, and the status of the GeoExplorer 3 data collection system. For example, the memory icon flashes when the memory is critically low.

Target icon, page 15-14
Satellite icon, page 15-14
Real-time position icon, page 15-15
External antenna icon, page 15-15
Lock icon, page 15-15
Memory icon, page 15-15
Backlight icon, page 15-16
Internal power icon, page 15-16
Logging icon, page 15-17

General Operation

Icon	Name	Description
✖	Target icon	Shows for three seconds (accompanied by a warning beep) when you approach within 15 meters of the target.
(satellite icon)	Satellite icon	Shows whether the geometry of the satellites is good or poor depending on the GPS configuration settings. This icon is always visible in the status bar. When the GeoExplorer 3 data collection system is computing GPS positions the number below the satellite icon indicates how many satellites are being used to compute positions. The satellite icon flashes to warn you that the geometry of the satellites is poor. The number flashes to indicate that too few satellites are available. You need a minimum of four satellites to compute GPS positions.

General Operation

Icon	Name	Description
>>((â	Real-time position icon	Shows that the GeoExplorer 3 is computing real-time positions. The real-time position icon flashes when the GeoExplorer 3 is in RTCM (see Glossary-16)-only mode and a real-time position cannot be logged, or when the RTCM age limit, page 19-24 has been exceeded. RTCM details are displayed on The Status Tab (see page 18-1). To configure the real-time settings, use the Real-time (see page 19-21) button.
◉	External antenna icon	Shows whether the external antenna is properly connected. When an external antenna is connected this icon appears. If it does not appear, there is a problem with the connection. The antenna (internal and external) details are displayed on the Status tab.
🔒	Lock icon	Shows that a configuration setting or task is locked. To unlock it you must have password control (see page 15-49).
🐟	Memory icon	Shows that the memory level is low (< 100 KB). This icon flashes when the remaining memory is critically low (< 10 KB). The memory details are shown on The Status Tab, page 18-1.

General Operation

Icon	Name	Description
♀ Normal ☼ Bright	Backlight icon	Shows that the backlight (see page 15-3) is on. The backlight has two different states: Normal and Bright. When the backlight is off no icon is visible. To change the state of the backlight press ⟨Fn⟩ ⟨DATA⟩.
▯	Internal power icon	Shows the level of the internal power source. This icon is always visible in the status bar. The battery icon appears full when the level of the power source is high. As the level of the power source decreases, the level shown by the battery icon decreases. The icon flashes to warn you that the level is low. The battery icon appears to be filling when the internal power is being charged. Power source details are displayed on The Status Tab (see page 18-1).

Icon	Name	Description
 Normal Paused	Logging icon	Shows whether the GeoExplorer 3 is successfully logging GPS positions. This icon appears to be drawing when successfully logging GPS data; in the case of averaged vertices, the concentric circles repeatedly contract. The number displayed above the icon indicates how many positions have been logged for the current feature. The icon will flash if conditions do not meet the specified GPS configuration. The logging icon has four different states: • Normal – the GeoExplorer 3 is logging code phase (C/A code) (see Glossary-4) measurements. • Paused – the GeoExplorer 3 has paused while logging GPS positions. When logging is paused, the GeoExplorer 3 stops recording GPS positions and this icon flashes. When you start logging again, the GeoExplorer 3 resumes logging GPS positions and the icon reverts to the logging icon.

General Operation

Icon	Name	Description
∫¹⁸ Carrier ⊙⁸ Averaged vertex	Logging icon (continued)	• Carrier – the GeoExplorer 3 is logging carrier phase measurements for Carrier Phase Data Collection (see page 12-1) or for a base station. Use the Feature Settings (see page 19-60) button to configure a feature for carrier accuracy. • Averaged vertex – the GeoExplorer 3 is logging Averaged Vertices within a line or area feature.

15.7   Interacting with the GeoExplorer 3 Data Collection System

You can interact with the GeoExplorer 3 data collection system in a variety of ways. The following topics describe the keypad and the different types of displays:

- Keys, page 15-20
- Screens, page 15-26
- Lists, page 15-29
- Forms, page 15-30
- Option Lists, page 15-32
- Pop-up Messages, page 15-35
- Data Entry, page 15-36

15.7.1 Keys

This diagram shows the location of the keys on the GeoExplorer 3 handheld.

Close,
page 15-22

Enter,
page 15-22

SYS section,
page 15-21

Function,
page 15-23

Option,
page 15-23

Arrow keys,
page 15-21

NAV section,
page 15-21

Power On/Off,
page 15-21

Log,
page 15-22

DATA section,
page 15-21
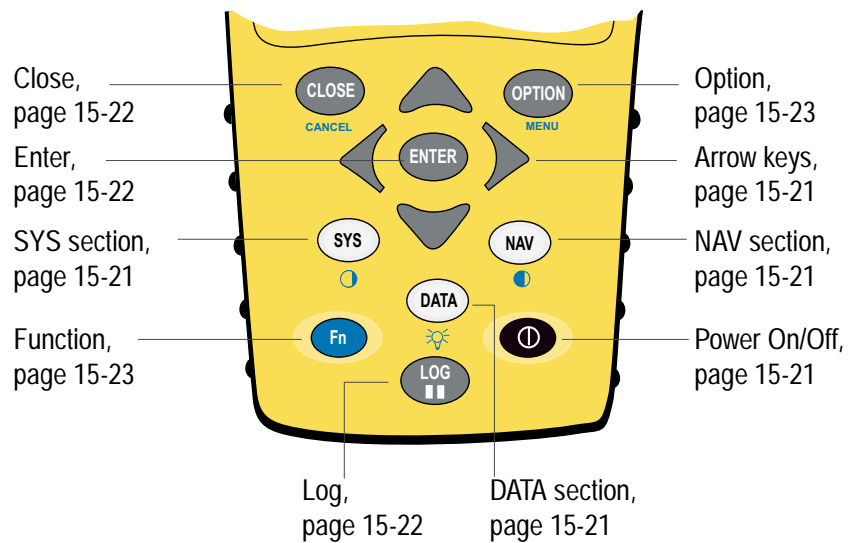
This table explains the various keys:

Key	Name	Use this key to …
⬭	Power On/Off	power the GeoExplorer 3 handheld on and off. Also used to activate the GeoExplorer 3 when in Standby mode in the GeoExplorer 3 support module.
⬭ SYS	SYS section	move from DATA or NAV sections to an active tab in THE SYS SECTION (see page 16-1). If you are already in the SYS section then pressing ⬭SYS cycles through the SYS tabs.
⬭ DATA	DATA section	move from SYS or NAV sections to an active tab in THE DATA SECTION (see page 20-1). If you are already in the DATA section then pressing ⬭DATA cycles through the DATA tabs.
⬭ NAV	NAV section	move from SYS or DATA sections to an active tab in THE NAV SECTION (see page 25-1). If you are already in the NAV section then pressing ⬭NAV cycles through the NAV tabs.
◁ ▷	Arrow keys	move the cursor or highlight.

General Operation

General Operation

Key	Name	Use this key to ...
△ ▽	Arrow keys	move the cursor or highlight. Scroll through numeric digits in a numeric entry field.
(CLOSE)	Close	close the current display. This includes closing and saving features and data files. Also press (CLOSE) to move up sub levels.
(ENTER)	Enter	select the highlighted item. Press (ENTER) whenever you want to choose an item from a list or open a field to edit.
(LOG)	Log	start, pause, or resume GPS logging. (LOG) can be used to control logging from almost any place throughout the GeoExplorer 3 data collection system. Use of the (LOG) key is explained in Collecting Data, page 6-10 and Advanced Datalogging Options, page 11-2.

Key	Name	Use this key to ...
(OPTION)	Option	display the list of advanced options that are available from your current screen. Most screens have one or more advanced options available from the (OPTION) key.
(Fn)	Function	access the secondary function of certain keys. These functions are shown in blue on the keypad. To use a secondary function, press (Fn) and then press the secondary function key. You do not need to hold down the keys at the same time.

Function	Use this key combination ...	to ...
Cancel	(Fn)(CLOSE)	close the current screen and cancel any changes. This includes changes to GPS or feature attributes. You may be prompted to confirm the cancel operation.

General Operation

Function	Use this key combination …	to …
Menu	fm	go to the Main Menu, page 15-7. Use the arrow keys to select the tab you want to go to, then press (ENTER). Alternatively, press (SYS), (DATA), or (NAV) to go directly to the appropriate screen.
Decrease contrast	(Fn) (SYS)	darken display contrast.
Backlight	(Fn) (DATA)	control the backlight. There are three settings—Bright, Normal, and Off.
Increase contrast	(Fn) (NAV)	lighten display contrast.
Page up	(Fn) △	page up. Move the cursor to the top of the current display. Also moves the Map cursor half a screen upwards.
Page down	(Fn) ▽	page down. Move the cursor to the bottom of the current display. Also moves the Map cursor half a screen downwards.

Function	Use this key combination ...	to ...
Home	(Fn) ◁	return to the beginning of a list or form. Useful in long lists and forms. Also moves the Map cursor half a screen to the left.
End	(Fn) ▷	return to the end of a list or form. Useful in long lists and forms. Also moves the Map cursor half a screen to the right.

General Operation

15.7.2 Screens

In the GeoExplorer 3, the top level **screens** for each tab are generally graphical and provide quick visual feedback. Alternatively, a screen contains buttons that let you access other displays. In most of the screens you can press the (OPTION) key to display the options. Use screens to view information graphically or to select buttons that provide access to other areas in the firmware. You cannot enter data in a screen, and you cannot edit the information displayed.
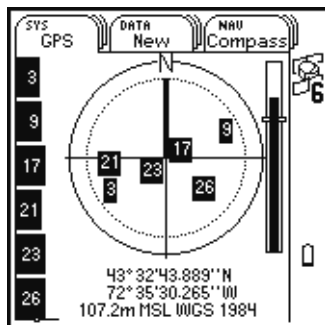
This example shows the GPS screen in the GPS tab. You can view this screen in different modes. This example shows the Standard mode.

Press (OPTION) to change to Advanced mode; press it again to return to Standard mode.

This example shows a screen with buttons. This is the Select screen in the Setup tab.
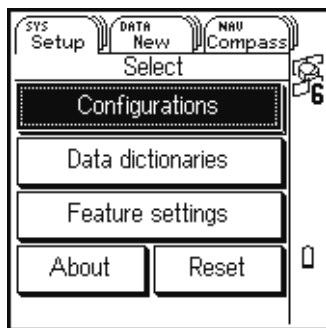
Buttons provide access to other areas of the GeoExplorer 3 data collection system. To select a button from a screen, use the arrow keys to highlight it and then press ⊂ENTER⊃.

Screens are "live"—any changes take place immediately. You do not need to close a screen to activate changes.

15.7.3 Message Boxes

A message box appears in some screens. It shows useful information or messages that may or may not be separated from other data on the screen by a horizontal line(s). The fields shown are read-only. They cannot be changed or edited.

Message box
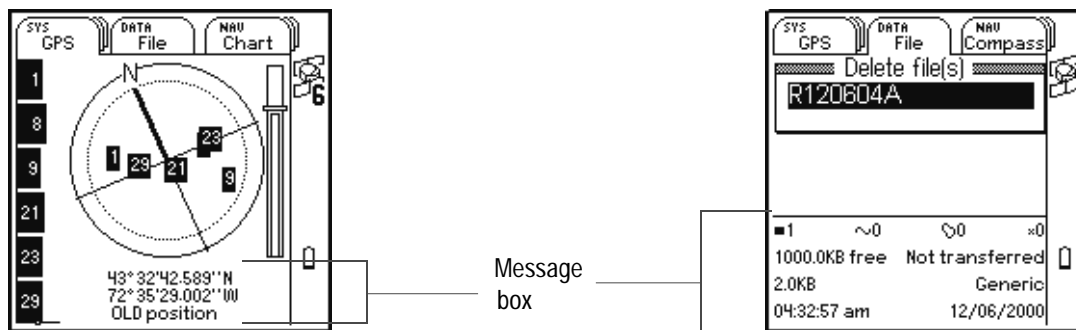
15.7.4 Lists

When selecting data files, data dictionaries, features, or waypoints, the GeoExplorer 3 provides a *list*. A list contains the information that is currently stored and available in the GeoExplorer 3 data collection system. A list always has a title that describes the items.

Title bar — Message box
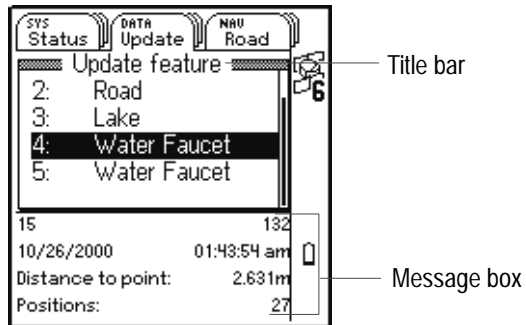
This is the Update feature list, as shown in the title bar. This list displays all features stored in the current data file. To select an item from a list, use the arrow keys to highlight the item and press (ENTER).

A message box is often displayed below the list and provides useful information about the item currently highlighted.

To close a list press (CLOSE).

Press (Fn) △ or (Fn) ▽ to move the highlight up or down the list, one page at a time.

Press (Fn) ◁ or (Fn) ▷ to move to the first or last item in the list.

NOTE   All option lists, sublists, forms, and checklists scroll in a cyclical fashion. If you position the highlight on the first (top) option in the list and press △ the highlight moves to the last (bottom) option. Similarly, if you position the highlight on the last option and press ▽ the highlight moves to the top option.

15.7.5 Forms

Data entry in the GeoExplorer 3 data collection system takes place in *forms*. These are like paper forms, in that they have a title and a sequence of lines or fields.

Prompt — (pointing to the form fields)

Title — (pointing to "Units")

Value — (pointing to "Square meters")

Current field — (pointing to "North reference: True")

Use a form to enter information.

Each field generally has two parts, a prompt (or name) and a value. A prompt is followed by a colon (:) that separates it from the value. Some fields are separator fields, which have no value and serve simply to divide a form into sections.

One field in every form is the current field. It is distinguished by being highlighted. Any editing operations on a form apply to the current field. To edit a field, select it by highlighting it and pressing (ENTER).

There are three ways to enter data into a form:

- Text entry, page 15-37
- Numeric entry, page 15-44
- Pop-up list, page 15-47

A form is "live". When you edit a field, the new value takes effect as soon as you accept the change by pressing CLOSE.

Press Fn △ or Fn ▽ to move up or down the form, one page at a time. This is equivalent to page up and page down. Use Fn ◁ or Fn ▷ to move to the first or last field in the form. This is equivalent to Home and End.

When you have finished browsing through the form, or have finished editing a field in the form, press CLOSE to return to the previous screen or list. When a feature attribute entry form is open, you can also press Fn CLOSE to abandon the feature.

15.7.6 Option Lists

Option lists display additional functions. In some places in the firmware you can press the ⬭OPTION⬭ key to display the options. For example, press ⬭OPTION⬭ when the Chart tab is active. The following options appear:
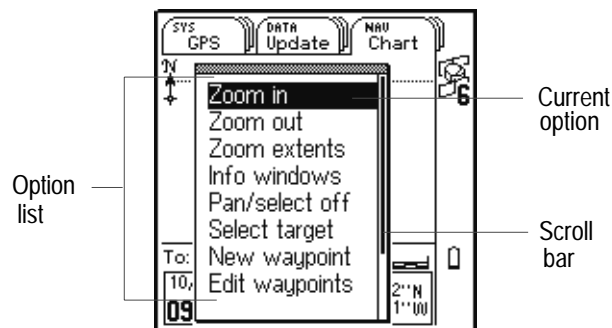
The current option in a list is highlighted. To select a different option, press △ or ▽ to move the highlight and then press ⬭ENTER⬭.

If an option list has more options than fit on one screen, a scroll bar appears on the right. Use △ or ▽ to scroll up and down the list.

Press ⬭Fn⬭ △ or ⬭Fn⬭ ▽ to move the highlight up or down the option list, one page at a time. Press ⬭Fn⬭ ◁ or ⬭Fn⬭ ▷ to move to the first or last option in the list. To close an option list press ⬭OPTION⬭ again, or press ⬭CLOSE⬭.

Sublists

Some options open into a sublist. A sublist relates to that option. For example, if you select the Filter option from the Update feature option list, the Filter by sublist appears:

Update feature option list

Filter

Filter by sublist
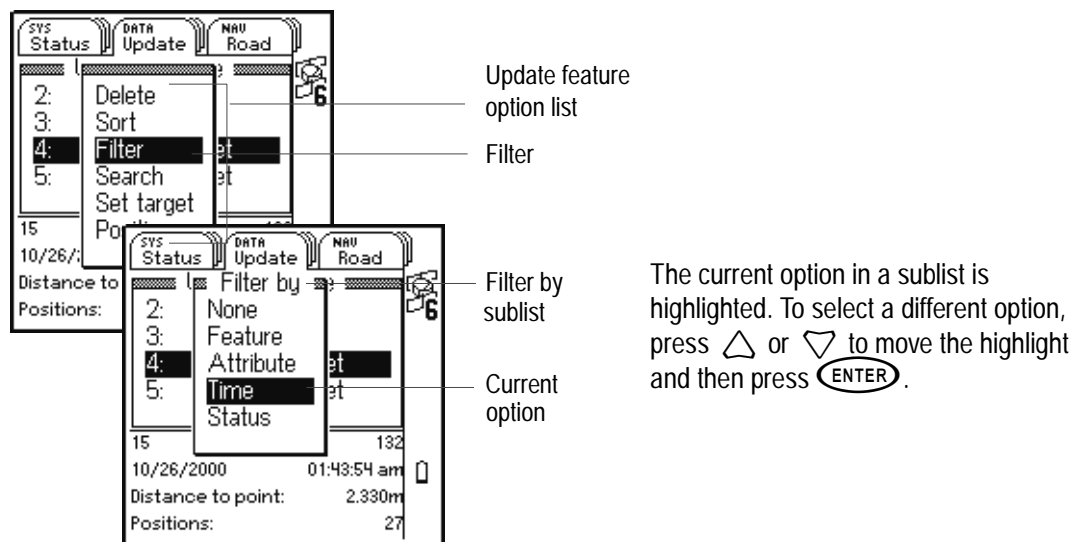
Current option

The current option in a sublist is highlighted. To select a different option, press △ or ▽ to move the highlight and then press (ENTER).

Press (Fn) △ or (Fn) ▽ to move the highlight up or down the sublist, one page at a time. Use (Fn) ◁ or (Fn) ▷ to move to the first or last option in the sublist. To close a sublist, press (CLOSE).

General Operation

Checklists

Some option lists open into a checklist. If you select Info windows from the Road option list, for example, the Info windows checklist appears:

To select an item in a checklist, use the arrow keys to highlight it and then press (ENTER). When it is selected a ✓ appears in the box on the left. To clear a ✓ , use the arrow keys to highlight the item and press (ENTER) . The ✓ is removed.

To close a checklist and save your changes, press (CLOSE) . To cancel any changes, press (Fn) (CLOSE) .

Checklist title

Scroll bar
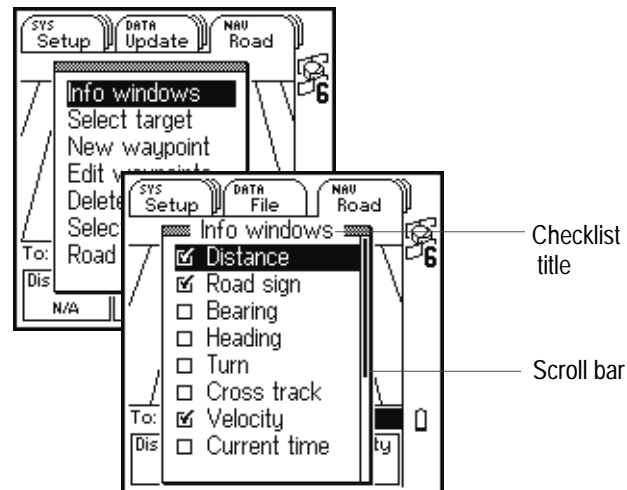
15.7.7 Pop-up Messages

Occasionally, a message "pops up". When the GeoExplorer 3 asks a question, a message pops up with two buttons, one of which you select in response. To do this, press ◁ or ▷ to highlight your response and then press (ENTER).

TIP   Press (CLOSE) to select No for Yes/No questions.
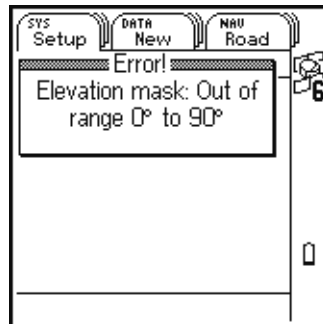
The Error screen is another example of a pop-up message. `Warning!` and `Error!` messages should be noted, because they contain important information about the task you are trying to perform.

To clear a message from the screen, press (CLOSE).

For more information, see GeoExplorer 3 Messages, page 30-15.

15.7.8 Data Entry

There are three ways to enter data. The methods available depend on the type of data to be entered:

- Text entry, page 15-37
- Numeric entry, page 15-44
- Pop-up list, page 15-47

To save time on data entry, a default value can be defined for each attribute in the data dictionary. You can either accept the default value that the system generates, or you can use the appropriate data entry method for that attribute to edit or replace the default value.

In addition, text and numeric attributes can be defined as Auto-incrementing attributes, page 19-70. Each new instance of an auto-incrementing attribute has a default value that is calculated by increasing or decreasing the last value by a specified amount.

Text entry

You can enter text using the text entry field.

Cursor — [screen diagram]

Attribute/Field name
Edit bar
Function bar
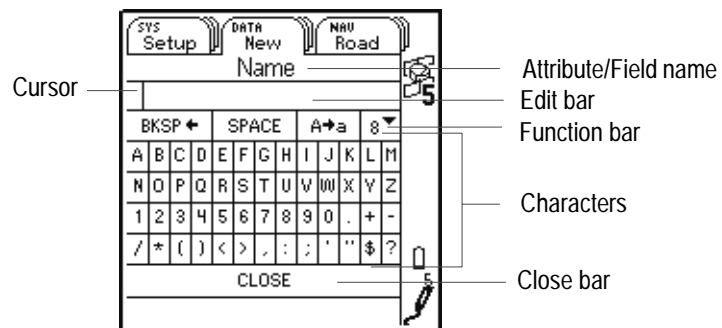
Press (OPTION) to view the
Option list (see page 15-40).

Characters

Close bar

General Operation

Use the Edit bar and characters to enter text. The text entry field contains the following:

- Attribute/Field name, page 15-38
- Edit bar, page 15-38
- Function bar, page 15-38

- Characters, page 15-38
- Close bar, page 15-39

Use this area …	to …
Attribute/Field name	view the name of the selected attribute or field.
Edit bar	enter or change the text value. The cursor flashes to indicate its current location in the Edit bar.
Function bar	• Use **BKSP** ← to delete characters to the left of the cursor. To backspace use the arrow keys to highlight the **BKSP** ← function and then press ⬭ENTER.
	• Use **SPACE** to insert a space in the Edit bar. Use the arrow keys to highlight the **SPACE** function and then press ⬭ENTER.
	• Use the **A➡a** function to change characters from uppercase to lowercase (and vice versa). Use the arrow keys to highlight the **A➡a** function and then press ⬭ENTER.
	• Use the **Matches** function to complete the text value by selecting from a list of strings that match the text entered so far. Use the arrow keys to highlight the **Matches** function, which shows the number of matching strings. Press ⬭ENTER to display a Pop-up list (see page 15-47) of the matching strings, highlight a string, and then press ⬭ENTER again to insert this string in the Edit bar.
Characters	select the characters for the text entry. To insert a character in the Edit bar, use the arrow keys to highlight the desired character and then press ⬭ENTER.

Use this area ...	to ...
Close bar	close the text entry field and save any changes. To save the entry in the Edit bar, use the arrow keys to highlight **Close** (at the bottom of the keypad) and then press (ENTER). You can also press (CLOSE) from anywhere in the form to save the new text and go to back to the previous form. To cancel any changes and restore the original value, press (Fn) (CLOSE).

Option list

Press ⬭OPTION⬭ , from the text entry field, to view the options.
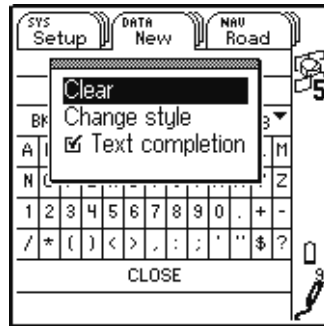
The options are:

- Clear, page 15-41
- Change style, page 15-41
- Text completion, page 15-41

Use this option...	to …
Clear	clear (delete) the text that is currently entered in the Edit bar.
Change style	change the layout of the characters that you can select. Choose from ABCDEF and QWERTY.
Text completion	enable or disable Text completion (see page 15-42). **NOTE** Text completion is only available when you are entering or editing attribute values.

General Operation

Text completion

When you are entering or editing attribute values, you can speed up data entry by using the text completion function. When text completion is enabled, the GeoExplorer 3 data collection system compares the text you have entered so far against a list of all the text strings you have entered previously, and all the attribute values in data files transferred from the GPS Pathfinder Office software.

If a match is found, the system fills in the rest of the string in the Edit bar with the matching text from the list. The list contains all the possible matches for the current attribute. Strings are ranked by age, so if more than one string matches the text you have entered so far, the one you used more recently is the one that is suggested.

Entered text —————— ————— Matching string

————— Number of possible matches
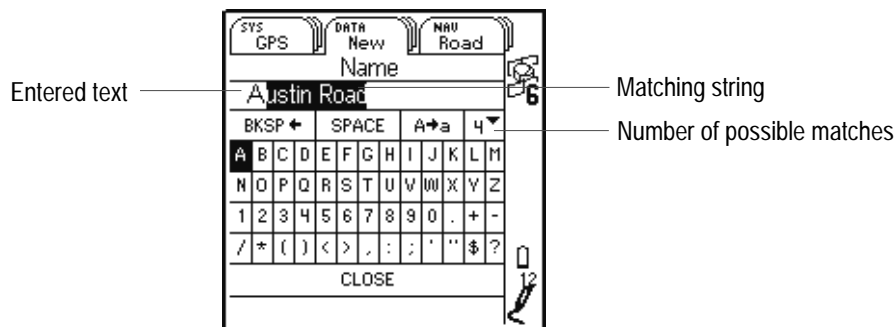
If the suggested text is correct, or close to the text you want to enter, press (Fn) ▷ to accept the suggested text and move the cursor to the end of the text in the Edit bar. You can still edit the text that is displayed after you have accepted the suggested text.

If the suggestion is not sufficiently similar to the text you want to enter, delete it by either selecting **BKSP ←** and pressing (ENTER), or entering another character.

The **Matches** function in the function bar shows you how many strings in the list match the text you have entered so far. If you select this function and then press ENTER, an alphabetical pop-up list of the matches appears. You can then select a string from the list and press ENTER to insert it into the Edit bar, or you can press CLOSE to close the pop-up list without selecting a string.
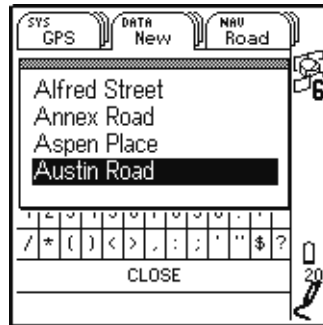
The predicted match is highlighted in the list of possible matches.

If a string that you want to remove appears in the pop-up list of matches, highlight it in the list, press OPTION to display the option list, and select Delete. The selected string is removed from the list and will no longer be matched to any text you enter.

TIP   Use the Reset text list option in the Setup tab's Reset (see page 19-74) list to clear all strings from the list.

Numeric entry

There are two types of numeric entry fields into which you can enter data.

- Single numeric entry, page 15-45
- Multiple option numeric entry, page 15-46

Single numeric entry

When you select a numeric field that requires single numeric entry, a field similar to this appears:
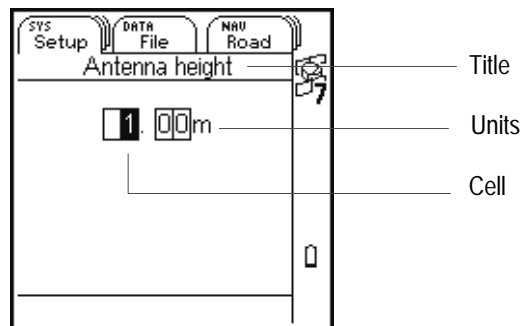
It contains a title, units and numeric cells.

To enter a value, press ◁ or ▷ to highlight a cell. When a cell is highlighted press △ or ▽ to scroll the value in the cell from 0 to 9. The cells are independent of each other. Press ⒺⓃⓉⒺⓇ to save the new value. When you press ⒺⓃⓉⒺⓇ the value entered becomes the new value for the selected field. You can also press ⒸⓁⓄⓈⒺ to close the numeric entry "field" and save changes. To cancel changes and restore the original value (before you changed it) press Ⓕⓝ ⒸⓁⓄⓈⒺ.

NOTE   The cells scroll in a circular fashion. When the value in the cell is 9, press △ to change the value to 0. When the value in the cell is 0, press ▽ to change the value to 9.

Multiple option numeric entry

When you select a numeric field that has multiple options, a field similar to one of these appears:
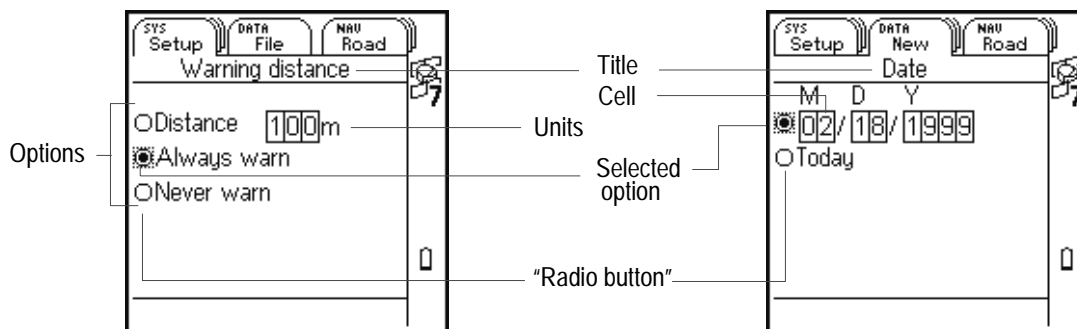
In the Warning distance field shown here, there is a title, units, numeric cells, and three options. Each option has a corresponding "radio button". The selected option has a highlighted radio button surrounded by a shaded box. In this example, Always warn is the selected option.

To change the option that is selected, press △ or ▽ until the corresponding radio button is highlighted.

To change the value for the selected option, press ◁ or ▷ to highlight a numeric cell. When you highlight a cell, the shaded box around the corresponding radio button disappears to indicate that a numeric cell is selected. With a cell highlighted, press △ or ▽ to scroll the number in that cell from 0 through 9. To move between cells, press ◁ or ▷. The cells are independent of each other. Press ENTER to save the new setting. When you press ENTER the value of the selected option becomes the new value for the field. You can also press CLOSE to close the numeric entry field and save changes.

To cancel changes and restore values to the original setting (before your changes), press
⬭Fn ⬭CLOSE .

NOTE   Values in a cell scroll in a cyclical way. When the value in the cell is 9, press △ to change the value
to 0. When the value in the cell is 0, press ▽ to change the value to 9.

Pop-up list

When you select a field that has many possible values, a pop-up list appears:

Field name

List of values for
the selected field
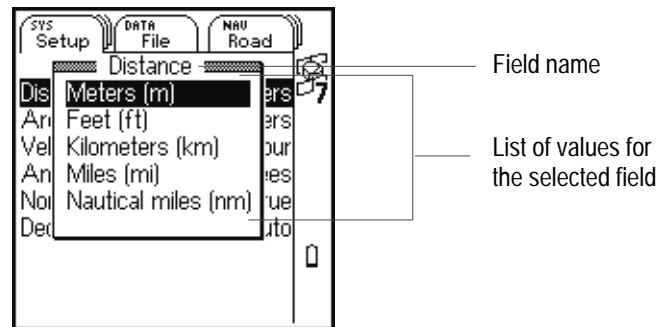
The current value in a pop-up list is highlighted. To select a different value, press △ or ▽ to move
the highlight and then press ⬭ENTER .

If a pop-up list has more options than fit on one screen, a scroll bar appears on the right. Use △ or ▽ to scroll up and down the list.

Scroll bar
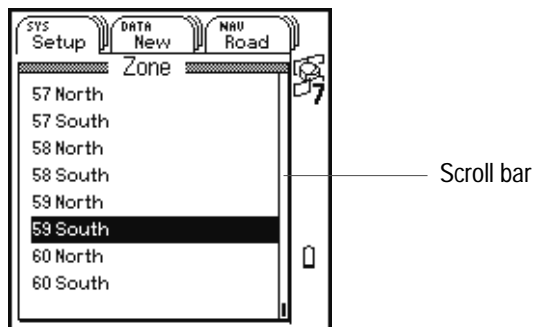
NOTE A pop-up list scrolls in a cyclical way. If you position the highlight on the first (top) value in the list and press △, the highlight moves to the last (bottom) value. Similarly, if you position the highlight on the last value in the list and press ▽, the highlight moves to the top value. Press (Fn) ◁ or (Fn) ▷ to move to the first or last option in the list.

15.8   Password Control

To lock configuration settings and tasks on the GeoExplorer 3 data collection system, you can set a password. Use the Configuration Manager utility in the GPS Pathfinder Office software to indicate which configuration settings and tasks to lock. For more information, refer to the GPS Pathfinder Office Help.

Locking and unlocking is useful when you do not want certain settings to be changed. If you create a configuration for a certain job and you do not want some settings to be altered, lock them by applying a password.

When configuration settings or tasks are locked, a lock icon appears in the Status Bar (see page 15-13).
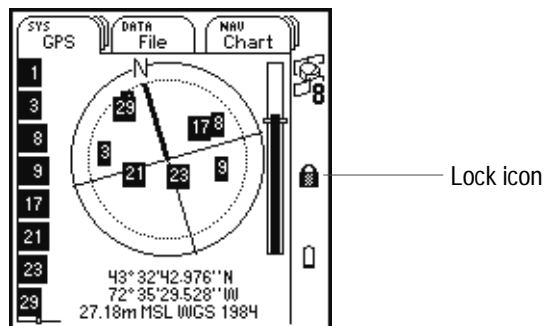
Lock icon

When a field is locked, the lock icon appears to the left of the field value as well as in the status bar.

Lock icon in field

Lock icon in status bar
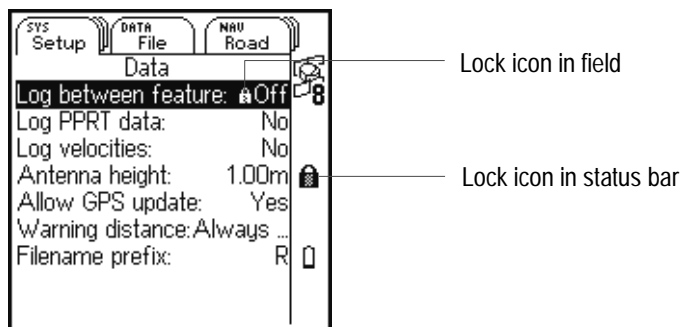
To edit a locked field, select it. (Highlight the field and press (ENTER).) You are prompted to enter the password, using Text entry (see page 15-37). If you enter the correct password, the field unlocks and you can edit the field.

NOTE If a configuration setting or task is locked, the GeoExplorer 3 data collection system remains password locked when turned off.

15.8.1 Re-lock Option

If you need to make changes to a locked task or configuration setting, you can remove the lock. To prevent further changes, lock the field again afterwards. To do this, press ⬭OPTION⬭ from the top level of The Setup Tab (see page 19-1) (the Select screen) and select Re-lock.
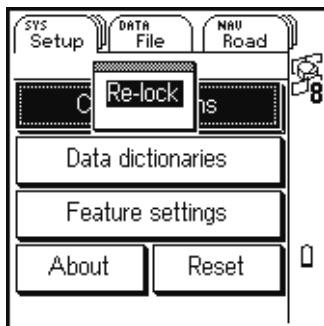
16 THE SYS SECTION

Use the SYS section to view GPS satellite information, check your current position, check the hardware status, and determine the quality of the GPS signal being received. Use it to configure the GeoExplorer 3 data collection system settings, create or edit data dictionaries, and alter feature settings.

Press ⬭SYS to move between the tabs in the SYS section. They are:

- The GPS Tab, page 17-1
- The Status Tab, page 18-1
- The Setup Tab, page 19-1

The SYS Section

17 The GPS Tab

SYS / GPS

To display the GPS tab, press **SYS** until the GPS tab is active. The Standard mode screen appears:

Signal strength

Skyplot

Satellite geometry

Current position
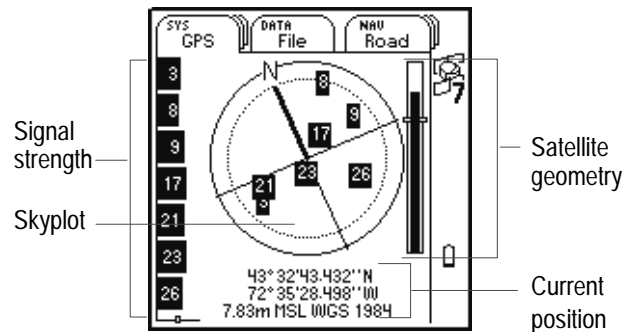
Use the GPS tab to view information about the satellites that the GeoExplorer 3 is tracking, and their relative positions.

Press **OPTION** to view the Advanced Mode (see page 17-10).

The Standard mode of the GPS tab is a graphical view of the GPS status. It contains:

- Skyplot, page 17-2
- Current GPS Position, page 17-4
- Signal Strength, page 17-8
- Satellite Geometry, page 17-9

17.1   Skyplot

The skyplot provides a graphical display of the position of the satellites available to the receiver:
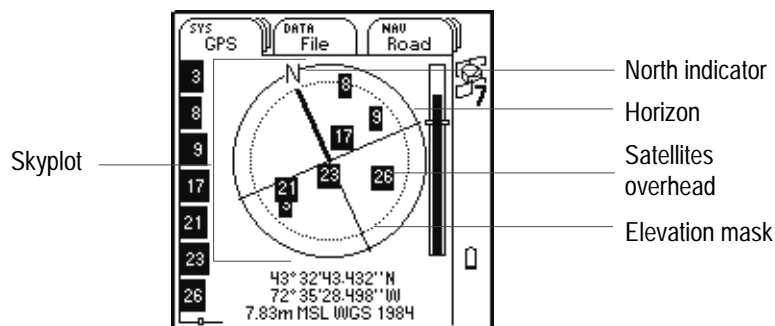
The outer circle represents the horizon (see Glossary-11) (at 0°). The inner circle represents the configured Elevation mask (see page 19-17). When the elevation mask is changed, the inner circle of the skyplot moves accordingly. If the elevation mask is increased, the inner circle gets smaller and only those satellites higher in the sky are used to compute GPS positions. If the elevation mask is decreased, the inner circle gets larger and satellites closer to the horizon are used to compute GPS positions.

Numbered boxes represent the satellites currently available to the GeoExplorer 3 data collection system. The satellites near the center of the circle are higher in the sky (overhead), while those toward the edge are closer to the horizon. The location of any one satellite can be determined by noting its direction (N, S, E, W) and approximate elevation in the skyplot.
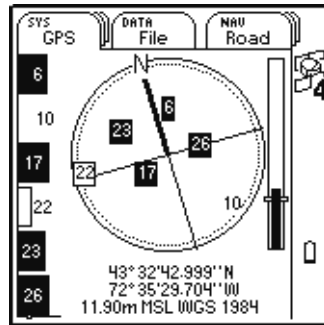
Satellites shown as black boxes are currently being used by the GeoExplorer 3 to compute GPS positions. Satellites with clear boxes are being tracked, but are not being used to compute positions. Satellites with no boxes are available, but are not being tracked by the GeoExplorer 3.

The skyplot rotates (like a compass) to indicate what direction the GeoExplorer 3 is pointing in.

NOTE   The skyplot only rotates if you are moving at walking speed or faster, or if you have calibrated the internal digital compass. For more details, see Calibration, page 27-8.

17.2   Current GPS Position

The current GPS position is shown at the bottom of the GPS tab. It displays the coordinates, altitude, and datum (see Glossary-5):
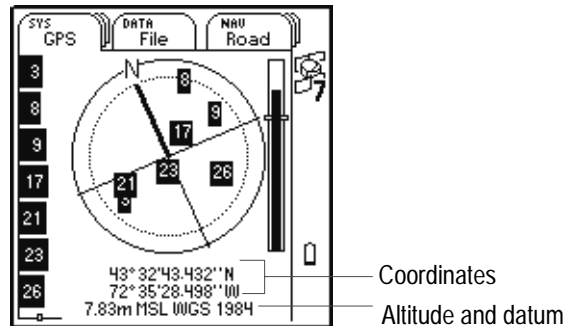
The GeoExplorer 3 searches the sky for satellite signals. It then determines which to use to compute the current GPS position, based on the configured GPS (see page 19-9) settings. The GeoExplorer 3 needs a minimum of four satellites to compute GPS positions.

Coordinates
Altitude and datum

Values are displayed in terms of the currently configured coordinate system and datum. If the datum name is too long, it appears truncated. To change this configuration use the Coordinates (see page 19-25) form.

For more information, see Coordinate Systems, page 13-1.

NOTE   Positions viewed on the screen are not saved. To save them, open a data file and start a feature, or create a waypoint.

The GPS Tab

17.2.1 Message Box

When the GeoExplorer 3 data collection system is not successfully computing GPS positions, a descriptive message appears in the message box at the bottom of the screen.

When you turn the GeoExplorer 3 on, it begins to track visible satellites and to calculate the current position. It takes up to 45 seconds to calculate the first position.
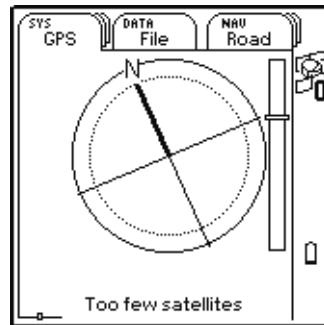
TIP   If no positions are computed, look for obstructions that might be blocking satellite signals. Move away from any possible obstructions. If the GeoExplorer 3 is still not computing positions, see Potential Problems, page 30-2.

Once the first position is displayed, subsequent positions are displayed once per second.

If the GeoExplorer 3 stops computing positions because too few satellites are available, two warning messages alternate in the message box. These messages indicate that the GPS position displayed is an old position and that there are too few satellites to compute a new one.
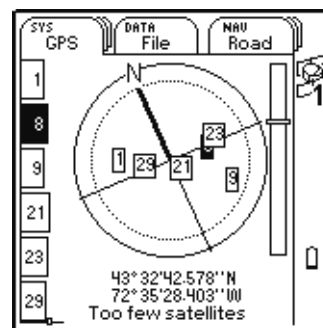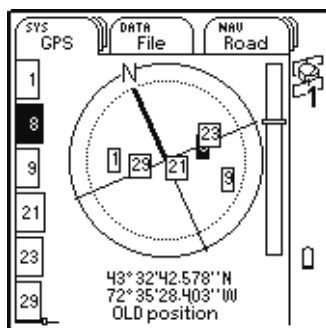
NOTE   When there are too few satellites to compute GPS positions, the number below the satellite icon in the Status Bar (see page 15-13) flashes. This icon is always visible, even when the GPS tab is not active.

If the GeoExplorer 3 stops computing positions because satellite geometry is poor, two warning messages alternate in the message box. These messages indicate that the GPS position displayed is an old position and that the geometry of the satellites is poor.
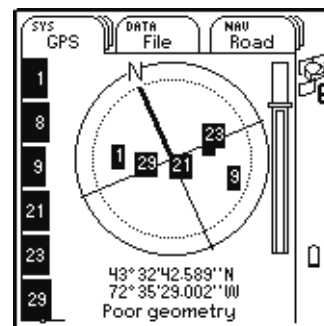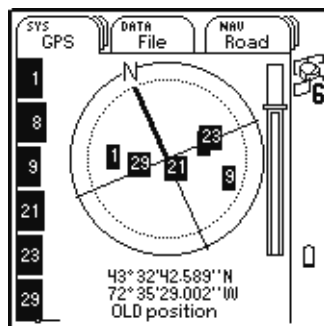
NOTE When the geometry of the satellites is poor, the satellite icon in the Status Bar (see page 15-13) flashes. This icon is always visible, even when the GPS tab is not active.

For more information, see Satellite Geometry, page 17-9.

The GPS Tab

17.3 Signal Strength

The signal strength bar graph is a graphical representation of the signal quality of each satellite that the GeoExplorer 3 is currently tracking. The signal strength of a satellite must be sufficient before it can be used by a GPS receiver. A black bar represents a satellite with a signal strength above the configured minimum level. An empty bar represents a satellite that is not being used to compute GPS positions. (The signal strength is below the configured minimum level.)

Strength of signal bar graph
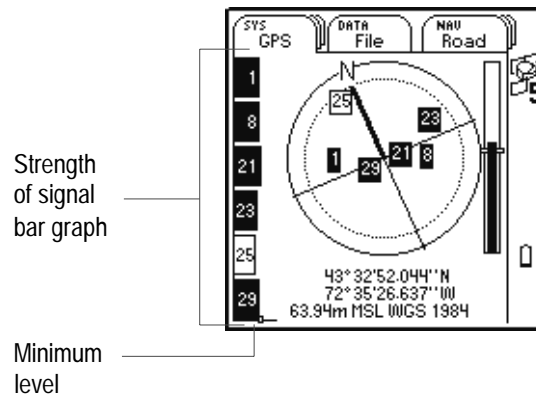
Minimum level

To change the minimum level, use the GPS (see page 19-9) slider bar.

17.4   Satellite Geometry

The satellite geometry indicator is a graphical representation of the overall quality of the GPS positions computed.

The quality of the computed positions is a function of the geometry of the visible satellites (how they are positioned in the sky relative to each other). When the satellites are well spaced, and cover a large portion of the sky, the GeoExplorer 3 data collection system is able to compute accurate positions. The

Level of quality

Minimum level

Satellite geometry indicator

level on the indicator is high. If satellites are grouped together in the sky, the accuracy of the computed positions is reduced. The level on the indicator is low.

When the level of quality falls below the minimum level, the GeoExplorer 3 stops computing GPS positions. The minimum level accepted is a configurable value. To change it, use the GPS (see page 19-9) slider bar.
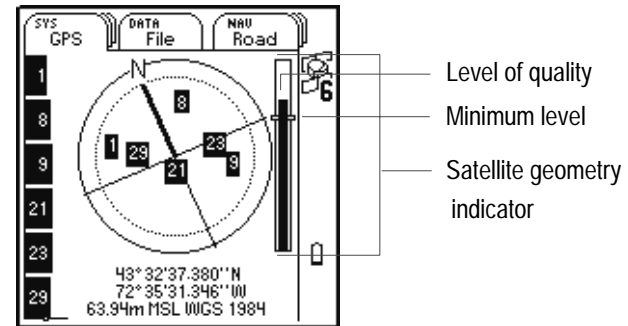
The GPS Tab

17.5   Advanced Mode

<u>SYS</u> / **GPS** / <u>OPTION</u> / **Advanced mode**

To display the GPS tab in Advanced mode, press <u>OPTION</u> and select Advanced mode.

———— Message box

Use this screen to view information about satellites as text. The message box at the bottom of the screen displays Almanac information and the current PDOP.

To return to the Standard mode, press <u>OPTION</u> and select Standard mode.

Advanced mode of the GPS tab displays the following information:

- PRN, page 17-11
- SNR, page 17-11
- Elev, page 17-11

- Br(T) or Br(M), page 17-12
- PDOP, page 17-13
- Almanac, page 17-15

NOTE   Use the GPS (see page 19-9) slider bar to configure the elevation, SNR, and PDOP mask.

This column...	lists...
PRN	the pseudorandom number (see Glossary-15) of each satellite. This number is used to uniquely identify each satellite. If the satellite is currently being used by the GeoExplorer 3 to compute positions, a ✓ appears to the left of the PRN.
SNR	the current signal-to-noise ratio of each satellite. The signal strength of a satellite is a measure of the information content of the signal, relative to the signal's noise. The typical SNR of a satellite at 30° elevation is between 10.0 and 15.0. The quality of a GPS position is degraded if the SNR of one or more satellites in the constellation falls below 4.0.
	The GeoExplorer 3 data collection system lets you set the SNR mask (see page 19-16). This value is used to determine whether the signal strength of a satellite is sufficient for that satellite to be used by the GPS receiver. If a satellite's SNR is below the configured SNR mask, that satellite is not used to compute positions.
	NOTE If a satellite is marked as "unhealthy" by the GPS Control Segment, the characters "U/H" appear in the SNR column for that satellite.
Elev	the current elevation above the horizon of each satellite. A satellite that is below the configured Elevation mask (see page 19-17) is not used to compute positions.

This column...	lists...
Br(T) or Br(M)	the current bearing (see Glossary-3) to each satellite. This bearing is shown relative to either true north (see Glossary-17) (T) or magnetic north (see Glossary-12) (M), as determined by the currently configured North reference (see page 19-34).

The GPS Tab

17.5.1 PDOP

The accuracy of a position computed by a GPS receiver is a function of the geometry of the GPS constellation visible at that moment in time. When the visible satellites are well separated in the sky, the GPS receiver can compute accurate positions. If two or more satellites are close together at the time the position is recorded, the small errors inherent in measuring their signals compound, reducing the accuracy of computed positions.

There are several Dilution of Precision (DOP) factors associated with GPS. These factors give an indication of the expected accuracy of the Global Positioning System (GPS). DOP factors are linear multipliers on the expected error, so a small DOP value is best. The best overall indicator of satellite constellation geometry is Position Dilution of Precision, or PDOP.

The GPS Tab

The PDOP value is a measure of positional accuracy. This table shows how PDOP values are categorized.
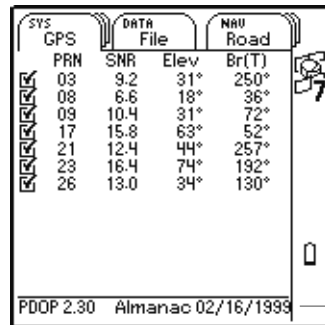
PDOP level	Quality
1 to 4	Excellent
4 to 6	Good
6 to 8	Fair
8 to 12	Poor
12 to 100	Very poor
100 and above	Unusable

The GeoExplorer 3 lets you specify a PDOP mask (see page 19-15). It uses this mask as an upper limit on PDOP values. You can configure the desired level of positional accuracy, and makes sure that the positions logged are of a certain quality. When the PDOP climbs above this mask, the GeoExplorer 3 stops computing GPS positions. This is indicated by the satellite icon in the Status Bar (see page 15-13).

17.5.2 Almanac

An almanac is a set of data that is used to predict satellite orbits over a moderately long period of time, usually about a month. The almanac contains clock information and information about the orbital path for each satellite (where it is in the sky at a particular time). The GeoExplorer 3 uses it to get a lock on satellites.

The GeoExplorer 3 takes approximately 15 minutes to collect a new almanac. It can collect an almanac and compute positions at the same time.

```
┌─────────────────────────────────┐
│ ⌐SYS    ╥⌐DATA   ╥⌐NAV          │
│  GPS    ║  File  ║  Road        │
│    PRN   SNR   Elev   Br(T)     │
│ ☑  03    9.2    31°    250°      │
│ ☑  08    6.6    18°     36°      │
│ ☑  09   10.4    31°     72°      │
│ ☑  17   15.8    63°     52°      │
│ ☑  21   12.4    44°    257°      │
│ ☑  23   16.4    74°    192°      │
│ ☑  26   13.0    34°    130°      │
│                                 │
│                          ▯      │
│ PDOP 2.30  Almanac 02/16/1999   │
└─────────────────────────────────┘
```
—— Almanac date

The bottom of the Advanced mode screen displays the date of the current almanac. If N/A is displayed instead of the almanac date, then the GeoExplorer 3 has not yet collected a complete almanac.

An almanac is required by Trimble's Quick Plan software. For more information, refer to the GPS Pathfinder Office Help.

The GPS Tab

The GPS Tab

18 The Status Tab

SYS / **Status**

To display the Status tab, press (SYS) until the Status tab is active. It appears in Standard mode.
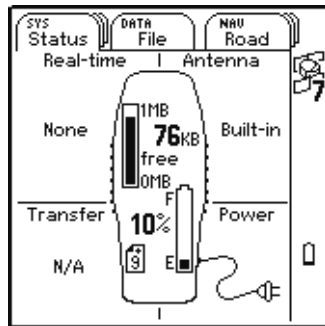
Use this screen to view information about the GeoExplorer 3 hardware, accessories, and external connections.

You can also display the Status tab in DGPS Mode (see page 18-10).

In Standard mode, the Status tab displays:

- Hardware, page 18-2
- Accessories and External Connections, page 18-4

18.1 Hardware

Information about the status of the GeoExplorer 3 hardware is shown on the inside of the GeoExplorer 3 diagram.
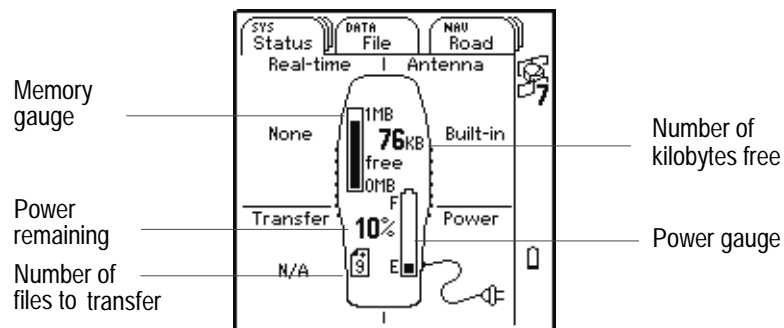
This screen displays the following hardware information:

- Memory gauge, page 18-3

- Power level, page 18-3

- Number of files to transfer, page 18-3

Display	Description
Memory gauge	The memory gauge is shown in the top portion of the GeoExplorer 3 diagram. It shows the level of memory available. The lower the level on the gauge, the more memory there is available. The higher the level on the gauge, the less memory there is available. The number of kilobytes (KB) free is also displayed.
Power level	The amount of internal power remaining is indicated by the power gauge and a percentage. The power gauge is displayed on the bottom right of the GeoExplorer 3 diagram. The higher the level on the gauge, the more internal power remains. The lower the level, the less internal power remains. The percentage of remaining power is indicated on the left of the power gauge.
Number of files to transfer	The number of files not yet transferred to an office computer is indicated in the bottom left of the GeoExplorer 3 diagram. This number indicates the number of data files, base and rover, that have not been transferred from the GeoExplorer 3 data collection system to an office computer.

The Status Tab

18.2 Accessories and External Connections

Information about accessories and the status of external connections is shown in the four panels surrounding the GeoExplorer 3 diagram.
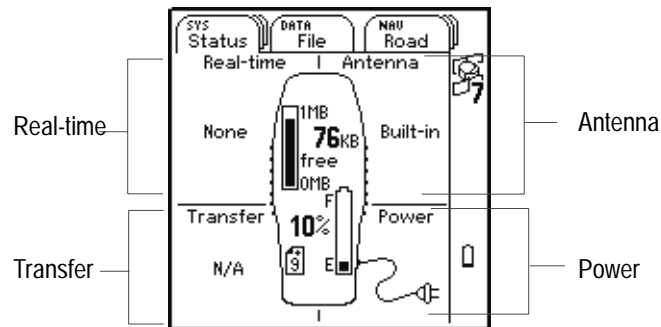
This screen displays the following information:

- Real-time,
  page 18-5
- Antenna,
  page 18-7
- Transfer,
  page 18-8
- Power,
  page 18-9

This panel …	shows …
Real-time	the current real-time position status. Depending on how the GeoExplorer 3 data collection system is configured, one of five icons or messages is displayed:
	Cabled and Cable-free BoB – When connected to the Beacon-on-a-Belt (BoB) receiver, the current status of the BoB is indicated in the panel. The possible states are Locked, Tracking, Searching, or Idle. The current frequency being tracked or locked onto is displayed below the BoB icon. The histogram on the left of the icon indicates the SNR (signal-to-noise ratio) of the differential GPS beacon signal being received. If the differential GPS beacon is not locked onto a frequency, then the frequency that it is currently trying to track is displayed, and the SNR histogram is empty.
	Cable-free BoB – Indicates that the GeoExplorer 3 data collection system is using the BoB receiver over the cable-free link.
	Cabled BoB – Indicates that the GeoExplorer 3 data collection system is using the BoB receiver over the cabled link.

The Status Tab

This panel …	shows …
Real-time (continued)	**Other** – Indicates that the GeoExplorer 3 is using an external radio for real-time corrections.
	None **None** – Indicates that the GeoExplorer 3 is not receiving real-time corrections.
	Too few satellites **Too few satellites** – Indicates that there are not enough satellites to compute GPS positions. Without a GPS position, it is not possible to get a real-time position.
	Poor geometry **Poor geometry** – Indicates that the geometry of the satellites is poor, so a real-time position is not generated.

This panel …	shows …
Antenna	the type of antenna in use.
	Built-in **Built-in** – Indicates that the GeoExplorer 3 is using the internal antenna.
	Connected – Indicates that the GeoExplorer 3 is using the external antenna.

The Status Tab

This panel …	shows …
Transfer	the data transfer status. There are three possible states:
IDLE	**IDLE** – Indicates that the GeoExplorer 3 is not sending or receiving data.
Transfer (icon, 105KB)	**Connected and transferring** – Indicates that the GeoExplorer 3 is connected to an office computer. Movement along the cable in the direction of the transfer indicates that data is being transferred. A message OK appears above the transfer icon when data transfer is complete, File Error indicates that the data transfer was unsuccessful. The number of bytes successfully transferred is indicated on the bottom of this icon.
NMEA (icon)	**NMEA** – Indicates that the GeoExplorer 3 is outputting NMEA (see Glossary-14) messages.

The Status Tab

This panel …	shows …
Power	the type of power source. Depending on the type of power source, one of three icons is displayed:
	Internal **Internal** – Indicates that the GeoExplorer 3 is using the internal power source.
	External – Indicates that it is using an external power source.
	Charging – Indicates that it is connected to an external power source and is charging.

The Status Tab

18.3 DGPS Mode

(SYS) / **Status** / (OPTION) / **DGPS mode**

To display the Status tab in the DGPS mode, press (OPTION) and select DGPS mode:
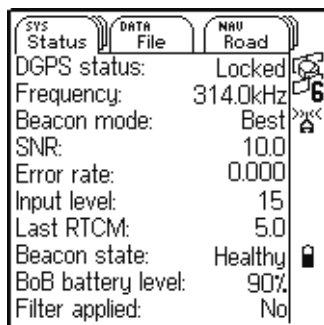
Use this screen when connected to the BoB receiver to view the real-time status of the BoB and GeoExplorer 3 in a text-based format.

In DGPS mode, the Status tab displays information about:

- DGPS status, page 18-11
- Frequency, page 18-11
- Beacon mode, page 18-12

- SNR, page 18-12
- Error rate, page 18-12
- Input level, page 18-12

- Last RTCM, page 18-12
- Beacon state, page 18-12
- BoB receiver battery level, page 18-12

- Filter applied, page 18-13

Field	Description
DGPS status	Whether the GeoExplorer 3 is receiving real-time corrected positions. There are five states: • **Locked / Tracking / Searching / Idle / WBFFT** – When the GeoExplorer 3 uses the BoB receiver for real-time corrections, one of these values appears in the DGPS status. Each value describes the status of the BoB receiver primary channel. Locked indicates that corrections are being received. • **RTCM OK** –The GeoExplorer 3 is using a radio source rather than the BoB receiver for real-time corrections. • **None** – The GeoExplorer 3 is not generating real-time corrected positions. • **Too few satellites** – There are not enough satellites to compute GPS positions. • **Poor geometry** – The geometry of the satellites is too poor. **NOTE** When the DGPS status is RTCM OK or None, the other fields show N/A.
Frequency	The current frequency of the satellite that is being tracked/locked onto. The available frequencies are between 283.5 kHz and 325 kHz.

The Status Tab

Field	Description
Beacon mode	Best – when the BoB receiver is in Best mode it will track the best frequency that it can, and will change frequencies if its current frequency becomes unsatisfactory. Fixed – when the BoB receiver is in Fixed mode it will track one frequency and will not alter from this frequency unless you alter the frequency manually on the BoB receiver.
SNR	The signal-to-noise ratio, measured in decibels (dB), of the differential GPS beacon frequency. An SNR of above 6.0 indicates that the signal is usable.
Error rate	The RTCM Word Error Rate. This is the number of RTCM words with parity errors, expressed as a decimal fraction. An error rate of below 0.1 is acceptable.
Input level	The intensity level of the electro-magnetic field, measured in decibels above one microvolt per meter (dBµ V/M). An input level between 10 dBµ V/M and 100 dBµ V/M is acceptable.
Last RTCM	The Last RTCM field indicates the time (in seconds) since the last RTCM message was received by the GeoExplorer 3. By default, the RTCM age limit (see page 19-24) is set to 50 seconds. Newer correction values yield greater precisions than older values.
Beacon state	The health of the signal received from the BoB receiver. Possible settings are Healthy, Unhealthy, and Unmonitored. The BoB receiver can be configured to use only beacons with a healthy signal.
BoB receiver battery level	The BoB receiver battery level field displays the remaining battery power of the BoB receiver, expressed as a percentage.

Field	Description
Filter applied	The Filter applied field indicates whether a filter has been applied to the frequency list on the BoB receiver.

NOTE   If the BoB receiver is not the real-time source then these fields will appear as N/A.

The Status Tab

19 The Setup Tab

<kbd>SYS</kbd> / **Setup**

To display the Setup tab, press <kbd>SYS</kbd> until the Setup tab is active. The Select screen appears:
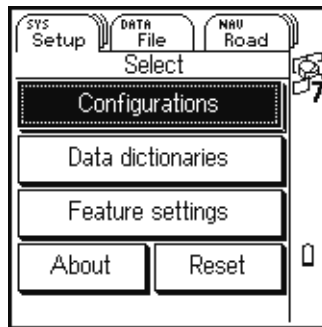
Use the Setup tab to create and edit data dictionaries, edit feature settings, and to edit the configuration. You can also reset the GeoExplorer 3 data collection system to the factory defaults and find out about the unit.

To select a button, highlight it and press <kbd>ENTER</kbd>.

Press <kbd>OPTION</kbd> to display the Re-lock Option (see page 15-51).

The buttons are:

- Configurations, page 19-2
- Data Dictionaries, page 19-48
- Feature Settings, page 19-60

- About, page 19-73
- Reset, page 19-74

The Setup Tab

19.1 Configurations

(SYS) / **Setup** / **Configurations**

Select the Configurations button to edit the configuration. This sets the parameters that determine how data is collected, entered, displayed, and communicated to external devices.

Select Configurations from the Setup tab. The Edit Configuration (see page 19-3) screen appears.

19.1.1 Edit Configuration

$\boxed{\text{SYS}}$ / **Setup** / **Configurations**

The Edit configuration screen displays configuration buttons:
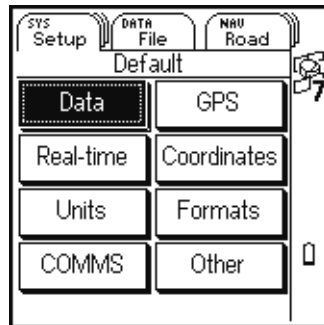
Use this screen to select a configuration form to view or edit. You can configure some critical configurations before collecting data. For example, GPS is a critical configuration. You can also set non-critical configurations to suit your application or preferences.

Press $\boxed{\text{CLOSE}}$ to close the Edit configuration screen.

When you select a configuration button, the corresponding configuration form appears:

- Data, page 19-4
- Coordinates, page 19-25
- COMMS, page 19-39

- GPS, page 19-9
- Units, page 19-30
- Other, page 19-46

- Real-time, page 19-21
- Formats, page 19-35

The Setup Tab

Data

SYS / Setup / Configurations / Data

Select the Data button from the Edit configuration screen. The Data form appears:

Use the Data form to configure how the data is collected.

When you select a field, the GeoExplorer 3 pops up a list of entries for that field, or prompts you to enter data.

Press CLOSE to close the Data form.

These fields are available in the Data form:

- Log between features, page 19-5

- Log PPRT data, page 19-6

- Log velocities, page 19-6

- Antenna height, page 19-6

- Allow GPS update, page 19-7

- Warning distance, page 19-7

- Filename prefix, page 19-8

Use this field …	to …	Default value
Log between features	specify a logging interval for recording GPS positions when you are between features. This provides a trail that shows where you travelled during a data collection session. (Log between features is a numeric entry (see page 15-44) field. Set the logging interval in time or distance units.) NOTE By default, the GeoExplorer 3 data collection system does not log positions unless a feature is selected. To log GPS positions when a feature is not selected, refer to Advanced Datalogging Options, page 11-2. Positions between features may be referred to as "Not in feature" positions in the GPS Pathfinder Office software and other Trimble datalogging software.	Off

The Setup Tab

Use this field …	to …	Default value
Log PPRT data	log the extra data needed to postprocess real-time data when you return to the office. To postprocess real-time data using differential corrections from a source other than that used in the field, you need to log extra information. This postprocessing real-time (PPRT) information is used to prepare the real-time data for postprocessing. Then, using the differential corrections, the data is postprocessed in the office. The PPRT data can provide even greater accuracy. The items in the pop-up list (see page 15-47) are: • Yes • No	No
Log velocities	select whether or not to log velocity (see Glossary-17) data. Log velocities when you are collecting GPS data in multipath conditions. Back in the office, these are then used during differential correction to eliminate the effects of multipath. The items in the pop-up list are: • Yes • No	No
Antenna height	enter the height of the antenna. The antenna height is the height of the GPS antenna above the feature you are collecting. Antenna height is a numeric entry (see page 15-44) field.	1.00 m

The Setup Tab

Use this field ...	to ...	Default value
Allow GPS update	specify whether or not positional data can be updated (replaced). The items in the Pop-up list (see page 15-47) are: • Yes – When you are updating a feature you can log new GPS positions. This new data replaces the positional information stored for the feature. • No – When you are updating a feature you cannot update (replace) the position information stored for that feature. You can update attributes, but not the position(s).	Yes
Warning distance	specify the warning distance between the original feature and your current position. When this distance is exceeded, a warning appears. For example, a warning distance of 5 m means that if you try to log GPS positions when you are more than 5 m away from the existing position for the feature, a warning message appears. This is a Numeric entry (see page 15-44) field.	Always warn

Use this field ...	to ...	Default value
Filename prefix	specify a single letter to identify the files you record. This is the first letter of the name of each automatically generated file. The rest of the file name is generated using the date and UTC (see Glossary-17) time it was created. This is a text entry (see page 15-37) field. **NOTE** This field does not affect base files. The filename prefix for base files is always "B".	R

The Setup Tab

GPS

SYS / **Setup** / **Configurations** / **GPS**

Select the GPS button from the Edit configuration screen. The GPS slider bar appears:

1

Slider bar

Current setting

Animated symbol

9
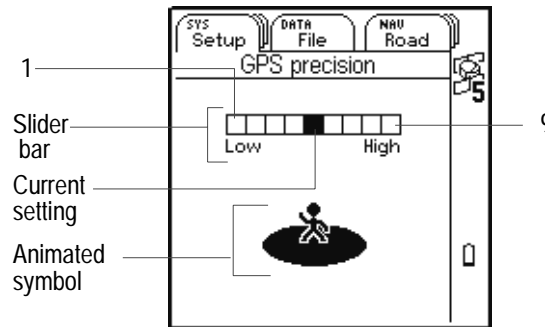
Use the GPS slider bar to configure the precision (quality) required for GPS positions. You can also display the GPS slider bar in Advanced mode (see page 19-11).

Press **CLOSE** to close the GPS slider bar.

The GPS slider bar has nine settings from Low to High. A highlighted cell represents the current setting.

To change the GPS slider bar setting, press ◁ or ▷. The animation changes accordingly. As you move the setting from High to Low, the GPS slider bar acts as a filter that accepts positions that are less precise.

NOTE   A change to the GPS slider bar takes effect as soon as the setting is adjusted.

When the GPS precision is set to a high value, the GeoExplorer 3 data collection system filters out, and will not use, positions that do not meet the specified level of quality. Use a high setting when a project requires high precision.

The Setup Tab

When the GPS precision is set to a low value, the specified level of quality is lower. The GeoExplorer 3 does not filter as many positions. Use a lower setting to collect more positions, including those that are slightly less precise.

If you are working on a project in a forest area, for example, the tree canopy can obstruct your view of the sky. Adjust the GPS slider bar to allow more positions to be recorded. Some positions may be of a lower quality, but the increased number of positions means that there are fewer gaps in the data collected. If the setting is too high, and the precision of the positions collected is high, positions may not be collected as often and you may not be able to map the entire area.

At the bottom of the screen is an animation that graphically represents the current GPS slider bar setting. As the setting moves from High to Low, the circle enlarges to indicate that the tolerance for accepting positions lessens.

NOTE   This GPS setting is a critical parameter so it is important that you configure the slider bar to suit the environment.

TIP   If you are collecting data and the satellite icon in the Status Bar (see page 15-13) flashes to warn that the satellite geometry is bad, try changing your position to improve the satellite geometry. Alternatively, stay where you are and wait for the satellite geometry to improve, or adjust the GPS slider bar.

Advanced mode

(SYS) / **Setup** / **Configurations** / **GPS** / (OPTION)

To display the Advanced mode of the GPS slider bar, press (OPTION) and select Advanced mode.

Current setting —
1 —

9

Custom check box

GPS form
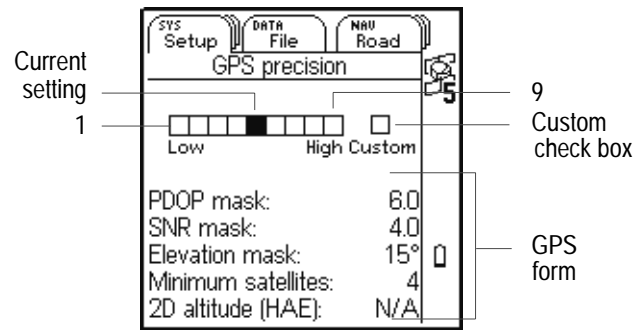
Use the slider bar to configure the precision or quality required for GPS positions.

Select the Custom check box to use the Custom option (see page 19-13).

Press (OPTION) to change back to Standard mode.

Advanced mode is similar to Standard mode, but it displays the GPS fields instead of an animation. The following fields are shown:

- PDOP mask, page 19-15
- SNR mask, page 19-16
- Elevation mask, page 19-17

- Minimum satellites, page 19-18
- 2D altitude, page 19-20

To change the slider bar setting, press ◁ or ▷. As you change this setting, the GPS fields change accordingly. As you move from High to Low, the slider bar acts as a filter that accepts more or less precise positions.

Each position on the slider bar has a specific PDOP, SNR, Elevation mask, Minimum satellites, and 2D altitude associated with it. This table shows these values:

Position on slider bar	PDOP mask	SNR mask	Elevation mask	Minimum satellites	2D altitude
1 (far left)	20	2	5	4	N/A
2	12	2.5	10	4	N/A
3	8	3	12	4	N/A
4	7	3.5	14	4	N/A
5 (default)	6	4	15	4	N/A
6	5.5	4.5	15	4	N/A
7	5	5	15	4	N/A
8	4.5	5.5	15	4	N/A
9 (far right)	4	6	15	4	N/A

NOTE   The Standard and Advanced modes are related. If you change a setting in one, this is reflected in the other. The position on the slider bar is always the same in the two modes.

The Setup Tab

Custom option

To display the Custom option of the GPS slider bar, press $\triangleright$ until the Custom check box is highlighted.
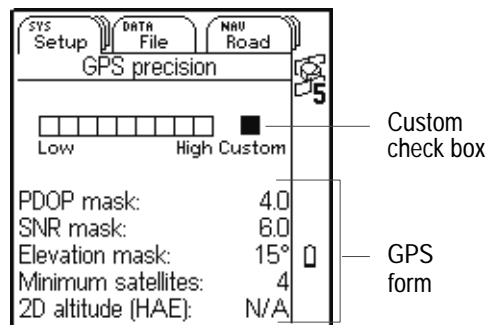
When the Custom check box is selected, use the GPS form to configure the parameters that affect the precision of the GPS positions.

When the Custom check box is selected, press $\triangle$ or $\triangledown$ to move between fields in the GPS form. To edit a field, select it, and press (ENTER). The appropriate Data Entry (see page 15-36) field appears. Press (CLOSE) to close the Advanced/Custom GPS form.

NOTE   The custom option is only available in Advanced mode. You cannot change the mode when the Custom check box is selected.

NOTE   When you adjust the PDOP mask, SNR mask, or elevation mask, the change is reflected on The GPS Tab (see page 17-1). The PDOP mask is represented by the minimum level mark on the position quality indicator. The SNR mask is represented by the minimum level mark on the signal strength bar graph. The elevation mask is represented by the inner circle on the skyplot.

The Setup Tab

These fields are available in the GPS form:

- PDOP mask, page 19-15
- SNR mask, page 19-16
- Elevation mask, page 19-17
- Minimum satellites, page 19-18
- 2D altitude, page 19-20
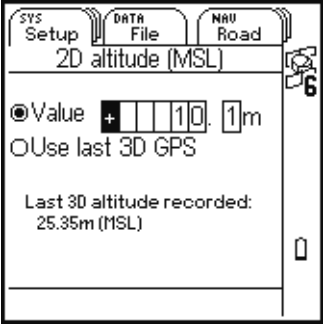
Use this field …	to …	Default value
PDOP mask	specify a PDOP mask. The GeoExplorer 3 uses this value as an upper limit to the PDOP (see page 17-13) value. This lets you program a desired level of positional accuracy, and make sure that any positions logged are of a certain precision. When the PDOP goes above this mask, the GeoExplorer 3 stops computing GPS positions and the satellite icon appears in the Status Bar (see page 15-13). This is a Numeric entry (see page 15-44) field. **CAUTION** Increasing the PDOP mask lets you log more positions, but the quality of these positions may be seriously degraded. It is better to retain a lower PDOP mask and use Trimble's mission planning software to identify the brief times of high PDOP, than to continue collecting data and compromise the accuracy of the positions collected. Schedule other activities during these times. Conversely, you should not set the PDOP mask too far below the default. A low setting significantly decreases the number of GPS feature positions, without significantly increasing the precision.	6.0

The Setup Tab

Use this field …	to …	Default value
SNR mask	specify the signal-to-noise ratio mask (or SNR mask). This value is used to determine whether the signal strength of each satellite is sufficient for that satellite to be used by the GPS receiver. If a satellite's SNR is beneath the configured SNR mask, it is not used to compute positions. This is a Numeric entry (see page 15-44) field. For more information about signal-to-noise ratio, see SNR, page 17-11. **CAUTION** If you lower the SNR mask, the GeoExplorer 3 data collection system uses satellites with weaker signals. This may increase GPS coverage in environments where the GPS signal is weakened (such as in forests), but it may reduce GPS precision.	4.0

Use this field …	to …	Default value
Elevation mask	specify the elevation mask. The GeoExplorer 3 can only use satellites above the specified elevation in the sky to compute GPS positions. This is a Numeric entry (see page 15-44) field. You rarely need to use an elevation mask lower than 15°, given the number of satellites in service. If you do lower the elevation mask, be aware that the increased ionospheric noise (see Glossary-11) associated with satellites low on the horizon will counter any improvement in PDOP given by the lower elevation mask. The effects of ionospheric noise increase as lower satellites are used. **CAUTION** Make sure that the elevation mask for a rover is set higher than that for the base station, so that the base station always tracks the same satellites that are visible to each rover. As a rover gets further from the base, the difference between the elevation mask of the rover and the base becomes more critical due to the curvature of the earth. As a rule of thumb, the difference must be at least 1° for every 100 km between the base and the rover.	15°

Use this field …	to …	Default value
Minimum satellites	specify the minimum number of satellites used to compute positions. The items in the pop-up list (see page 15-47) are: • 3 – Use this configuration if satellite visibility is poor and you can determine your altitude above the WGS-84 ellipsoid very accurately at all times. The GeoExplorer 3 data collection system uses four satellites to compute GPS positions when it is able to, but when the number of visible satellites falls to three, it continues to compute positions. A position computed when there are only three usable satellites is called a two-dimensional position, and the accuracy of two-dimensional positions is crucially affected by the accuracy of the altitude. You can configure the GeoExplorer 3 to use the altitude of the last available 3D position, or the altitude that you have entered in the 2D altitude (see page 19-20) field. **CAUTION** If you set the minimum number of satellites to 3, and specify an inaccurate altitude, this has a significant impact on the position computed by the GeoExplorer 3 data collection system. As a rule of thumb, every meter of error in the altitude you supply is likely to cause at least three meters of error in the horizontal position computed by the GeoExplorer 3 data collection system.	4

Use this field …	to …	Default value
	• 4 – Use this configuration to achieve a high level of accuracy for logged positions. The GeoExplorer 3 data collection system uses as many satellites as it can (but at least four) to compute positions. This configuration usually yields the most accurate GPS positions and is the most flexible. If more than four satellites are available, the GeoExplorer 3 computes GPS positions with an overdetermined solution.	
	• 5 – Use this configuration when doing Carrier Phase Data Collection (see page 12-1). The GeoExplorer 3 uses as many satellites as it can to compute positions. With this setting, GPS positions are logged only if there are at least five satellites available. This ensures that all logged positions have an overdetermined solution. This configuration yields the most accurate GPS positions.	
	CAUTION The Minimum satellites field fundamentally affects the operation of the GPS receiver. Only modify it when you fully understand the consequences of any proposed changes.	

The Setup Tab
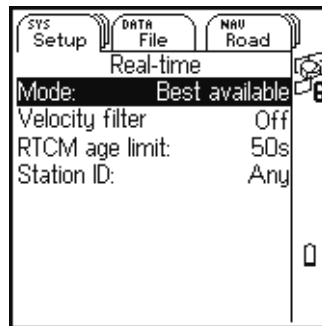
Use this field …	to …	Default value
2D altitude	specify the altitude to be used for 2D positions. You can manually enter the altitude value using the Numeric entry (see page 15-44) field, or select the Use last 3D GPS option. The last 3D altitude recorded is shown at the bottom of the screen. This field is only available when the minimum number of satellites is configured to 3. When the minimum number of satellites is set at 4 or 5, the 2D altitude is automatically set at N/A. **NOTE** It is important to specify the 2D altitude relative to the configured Altitude reference (see page 19-27).	Use last 3D GPS

NOTE   If the elevation mask is configured to 4° or below, the GeoExplorer 3 automatically uses 12 channels to receive GPS signals.

Real-time

(SYS) / **Setup** / **Configurations** / **Real-time**

Select the Real-time button from the Edit configuration screen. The Real-time form appears:

```
┌─────────────────────────────────┐
│ ╱SYS ╲╱DATA ╲╱ NAU ╲            │
│ │Setup││ File ││Road │          │
│      Real-time          ⬒6      │
│ Mode:      Best available       │
│ Velocity filter       Off       │
│ RTCM age limit:       50s       │
│ Station ID:           Any       │
│                                 │
│                          ▯      │
│                                 │
└─────────────────────────────────┘
```

Use this form to configure parameters for collecting data using RTCM (see Glossary-16).

Press (CLOSE) to close the Real-time form.

These fields are available in the Real-time form:

- Mode, page 19-22
- Velocity filter, page 19-23
- RTCM age limit, page 19-24

- Station ID, page 19-24

The Setup Tab

Use this field …	to …	Default value
Mode	indicate which positions are displayed and recorded. The items in the pop-up list (see page 15-47) are: • Best available – this uses RTCM corrected positions if available, otherwise uncorrected positions will be displayed and recorded. • RTCM only – only GPS positions that have been corrected in real time are displayed and recorded. The real-time position icon appears in the Status Bar (see page 15-13).	Best available

Use this field …	to …	Default value
Velocity filter	smooth real-time corrected positions as they are generated, using velocity information. Use the velocity filter to remove the effects of multipath on real-time corrected positions. The items in the pop-up list are: • Off – velocity filtering will not be applied in real-time. • Auto – velocity information is used to filter all real-time corrected positions, unless Log PPRT data, page 19-6 is set to Yes. **WARNING** Applying the velocity filter to real-time corrected positions may introduce inaccuracies to positions not affected by multipath. If you are unsure about whether or not you will encounter multipath in a field session, Trimble recommends that you Log PPRT data (see page 19-6) and Log velocities (see page 19-6) for use in the GPS Pathfinder Office Differential Correction utility. For more information, refer to the GPS Pathfinder Office Help.	Off

The Setup Tab

Use this field …	to …	Default value
RTCM age limit	specify the RTCM age limit. This is the time for which the receiver continues to apply a projected correction (based on the most recent correction received) to each new GPS position that it computes. If no new real-time corrections are received in the specified time, the most recent correction is considered too old to provide accurate, corrected positions. When this occurs, the GPS receiver stops using the corrections, and you are warned that the real-time link is lost. Items in the pop-up list (see page 15-47) are: • 5 s • 50 s • 10 s • 100 s • 15 s • 250 s • 20 s • 25 s	50 s
Station ID	enter a specific RTCM base station ID. This must be a number between 0 and 1023. The ID number identifies the RTCM station and lets the GeoExplorer 3 data collection system locate and use a particular base station. By default, the receiver attempts to choose the "best" RTCM station (based typically on the distance to the base station). This is a numeric entry (see page 15-44) field or you can select Any.	Any

The Setup Tab

Coordinates

⬭ SYS ⬭ / Setup / Configurations / Coordinates

Select the Coordinates button from the Edit configuration screen. The Coordinates form appears:

Use this form to configure parameters that affect how data is collected and displayed. Specify a datum transformation and a map projection to see the GPS position, and the position of the features that you collect displayed, in your local coordinate system. This makes it easy to check your position or navigate using a map produced by your GIS.

Press ⬭ CLOSE ⬭ to close the Coordinates form.

These fields are available in the Coordinates form:

- System, page 19-26
- Altitude reference, page 19-27
- Altitude units, page 19-29

- Zone, page 19-27
- Geoid, page 19-28

- Datum, page 19-27
- Coordinate units, page 19-29

Use this field …	to …	Default value
System	specify the coordinate system to be used when entering and displaying coordinates. Select this field to display a list of coordinate systems currently loaded on the GeoExplorer 3 handheld. Items in the pop-up list (see page 15-47) are: • Latitude/Longitude • Universal Transverse Mercator (UTM) NOTE To transfer other Coordinate Systems (see page 13-1) to the GeoExplorer 3, use the Coordinate System Manager utility. For more information, refer to the GPS Pathfinder Office Help. You cannot transfer coordinate systems from GPS Pathfinder Office to the GeoExplorer 3c edition. NOTE To reset the list of available coordinate systems, press (OPTION) and select Reset. For more information, see Resetting Coordinate Systems, page 13-12.	Latitude/ Longitude

Use this field …	to …	Default value
Zone	specify the zone (if applicable) to be used when calculating coordinates. Select this field to display the zones that apply to the coordinate system selected in the previous field. If only one zone is available for the selected coordinate system, this field is read-only.	N/A
Datum	view (and in some cases specify) the datum (see Glossary-5) to be used when calculating coordinates. Depending on the selected system and zone, this field may be read-only.	WGS 1984
Altitude reference	specify the altitude reference to be used when entering and displaying altitude values. Items in the pop-up list (see page 15-47) are: • Mean Sea Level (MSL) (see Glossary-12) • HAE (see Glossary-10) (Height above ellipsoid)	MSL

The Setup Tab

Use this field …	to …	Default value
Geoid	specify the geoid (see Glossary-9) model to be used for calculating the height above mean sea level. This field is only available when the selected altitude reference is MSL. Each geoid must be referenced to a coordinate system for it to be configured as the current geoid. To do this, specify the geoid when transferring the coordinate system to the GeoExplorer 3 or when creating a coordinate system export file in the Coordinate System Manager utility. (For more information, refer to the GPS Pathfinder Office Help.) The supplied geoid is the DMA 10x10 (Global) model. Use the GPS Pathfinder Office software to transfer other geoids to the GeoExplorer 3 handheld. To delete a geoid, select the Geoid field and highlight the geoid you want to delete. Press OPTION and select the Delete option. You are prompted to confirm the deletion. Configurations using this geoid return to the default setting, the DMA 10x10 geoid. **NOTE** You cannot delete the DMA 10x10 (Global) geoid or a geoid that is currently in use.	DMA 10x10 (Global)

Use this field …	to …	Default value
Coordinate units	specify the units to be used for entering and displaying coordinates when using a coordinate system other than Latitude/Longitude. Items in the pop-up list (see page 15-47) are: • Meters (m) • Namibian Meters (NAm) • Feet (ft) • Yards (yd) • US Survey Ft (sf)	N/A
Altitude units	specify the units to be used for entering and displaying altitude units. Items in the pop-up list (see page 15-47) are: • Meters (m) • Feet (ft)	Meters

NOTE   Some fields will display N/A, depending on how related fields are configured.

NOTE   When you transfer a configuration file from the GPS Pathfinder Office software and a coordinate system is specified, that coordinate system is displayed by default. If you do not transfer the appropriate files, system defaults are displayed.

The Setup Tab

Units

Select the Units button from the Edit configuration screen. The Units form appears:

```
┌─────────────────────────────┐
│ SYS  │ DATA │ NAV           │
│ Setup│ File │ Road          │
│        Units              ⊠ │
│ Distance:        Meters   6 │
│ Area:      Square meters    │
│ Velocity:       Km/Hour     │
│ Angle:          Degrees     │
│ North reference:    True    │
│ Declination:        Auto    │
│                          □  │
│                             │
└─────────────────────────────┘
```

Use this form to configure how units are to be entered and displayed.

Press CLOSE to close the Units form.

These fields are available in the Units form:

- Distance, page 19-31
- Area, page 19-31
- Velocity, page 19-32
- Angle, page 19-33
- North reference, page 19-34
- Declination, page 19-34

Use this field ...	to ...	Default value
Distance	specify the units to be used when entering and displaying distances. Items in the pop-up list (see page 15-47) are: • Meters (m) • Nautical Miles (nm) • Feet (ft) • Kilometers (km) • Miles (mi)	Meters
Area	specify the units to be used when entering and displaying area. Items in the pop-up list (see page 15-47) are: • Square meters (m^2) • Square kilometers (km^2) • Square feet (ft^2) • Square miles (mi^2) • Hectares (Ha) • Acres (A)	Square meters

The Setup Tab

Use this field ...	to ...	Default value
Velocity	specify the units to be used when entering and displaying velocity (see Glossary-17). Items in the pop-up list (see page 15-47) are: • Meters/Second (m/s) • Knots (kt) • Feet/Second (ft/s) • Km/Hour (kph) • Miles/Hour (mph)	Km/Hour

Use this field …	to …	Default value
Angle	specify the units to be used when entering and displaying bearing angles. Items in the pop-up list (see page 15-47) are: • Degrees (°) • Rhumbs (rh) • Gradians (gon) • Mils (mil) **NOTE** Angle units only affect angles displayed when navigating and entering offsets. They do not affect: • the bearings shown in the Advanced mode screen of the GPS tab. • the entry or display of latitudes and longitudes (which are always entered and displayed in degrees with optional minutes and/or seconds).	Degrees

The Setup Tab

Use this field …	to …	Default value
North reference	specify whether bearings are displayed relative to true north (see Glossary-17) or magnetic north (see Glossary-12). Items in the pop-up list (see page 15-47) are: • True – useful when navigating relative to a background map. • Magnetic – useful when using a magnetic compass to navigate.	True
Declination	specify the magnetic declination (see Glossary-12) for your area, which is printed on most accurate maps. This is a numeric entry field, or you can select Auto. Items in the pop-up list are: • Value – enter the declination. If you move a significant distance, it may be necessary to update the declination. • Auto – if you do not know the magnetic declination, or prefer not to update it as you move, the GeoExplorer 3 uses an internal database to determine the declination based on your current position.	Auto

The Setup Tab

Formats

(SYS) / **Setup** / **Configurations** / **Formats**

Select the Formats button from the Edit configuration screen. The Formats form appears:

```
┌─────────────────────────────┐
│ ╱SYS ╲╲╱DATA╲ ╱NAU ╲        │
│ Setup  │ File │ Road │      │
│       Formats          ⌂7   │
│ Language:      English       │
│ Offset:       Horz/Vert      │
│ Degrees:      DD°MM'SS.ss"    │
│ Date:        MM/DD/YYYY       │
│ Time:          12 Hour        │
│ Time zone:       00:00        │
│ Coordinate order: Lat/Long ▯ │
│                               │
└─────────────────────────────┘
```

Use this form to configure the parameters that affect the formats used to enter and display data.
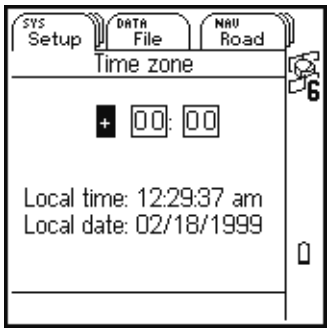
Press (CLOSE) to close the Formats form.

These fields are available in the Formats form:

- Language, page 19-36
- Offset, page 19-36
- Degrees, page 19-36

- Date, page 19-37
- Time, page 19-37
- Time zone, page 19-38

- Coordinate order, page 19-38

The Setup Tab

Use this field ...	to ...	Default value
Language	specify the language that you want to work with. A number of languages are loaded on the GeoExplorer 3. Additional languages are available from the Trimble Web site (www.trimble.com).	English
Offset	specify the format to be used when entering offsets. Items in the Pop-up list (see page 15-47) are: • Horz/Vert – horizontal and vertical distance • Slope/Incl – slope distance and inclination	Horz/Vert
Degrees	specify the format to be used when entering angles that use degrees (including latitudes and longitudes). Items in the Pop-up list (see page 15-47) are: • DD°MM'SS.ss" • DD°MM.mmm • DD°.ddd	DD°MM'SS.ss"

Use this field ...	to ...	Default value
Date	specify the format to be used when displaying the local date in the Time zone field. Items in the Pop-up list (see page 15-47) are: • DD/MM/YYYY • YYYY/MM/DD • MM/DD/YYYY	MM/DD/YYYY
Time	specify the format to be used when displaying the local time in the Time zone field. Items in the pop-up list (see page 15-47) are: • 12 hour • 24 hour	12 hour

The Setup Tab

Use this field ...	to ...	Default value
Time zone	specify the time zone to be used by the GeoExplorer 3 data collection system. This is a numeric entry (see page 15-44) field. Set the time zone by adjusting the value to display the correct local time and date.	00:00
Coordinate order	specify the order to be used when displaying a position's coordinates. Items in the pop-up list (see page 15-47) are: • Lat/Long • East/North • Long/Lat • North/East	Lat/Long (North/East)

The Setup Tab

COMMS

⬭SYS / **Setup** / **Configurations** / **COMMS**

Select the COMMS button from the Edit configuration screen. The COMMS form appears:

Use this form to set the parameters for communication with external devices. These affect data transfer to and from an office computer, and communication with radios when receiving real-time corrections or NMEA (see Glossary-14) output messages.

Press ⬭CLOSE to close the COMMS form.

These fields are available in the COMMS form:

- Data transfer, page 19-40
- RTCM input, page 19-41
- NMEA output, page 19-42

Port settings:

- Input baud rate, page 19-43
- Output baud rate, page 19-43
- Data bits, page 19-44

- Stop bits, page 19-44
- Parity, page 19-45

The Setup Tab

Use this field …	to …	Default value
Data transfer	specify the device used to connect the GeoExplorer 3 to the office computer. Items in the pop-up list (see page 15-47) are: • Support module – the GeoExplorer 3 must be placed in the GeoExplorer 3 Support Module, page 3-11 for data transfer to the office computer to occur. • Serial clip – the Serial Clip, page 3-18 must be attached to the rear of the GeoExplorer 3 and connected to the computer using a null modem cable for data transfer to occur. • Off – data transfer to the office computer is disabled. NOTE The Data transfer field cannot be set to the same value as configured in the RTCM (see page -16) input or NMEA (see page -14) output fields (except Off).	Support module

Use this field …	to …	Default value
RTCM input	specify the connection device used to receive RTCM (see page -16) messages. Items in the pop-up list (see page 15-47) are: • Cable-free BoB **NOTE** This option is not available with the GeoExplorer 3c edition. • Support module • Serial clip • Off **NOTE** The RTCM input field cannot be set to the same value as the Data transfer field (except Off). **NOTE** When using RTCM input without the optional RTCM/NMEA splitter cable, the NMEA output (see page 19-42) must be set to Off.	Cable-free BoB or Serial clip (with GeoExplorer 3c edition)

The Setup Tab

Use this field …	to …	Default value
NMEA output	specify the connection device used to output NMEA (see page -14) messages. Items in the pop-up list (see page 15-47) are: • Support module • Serial clip • Off **NOTE** The NMEA output field cannot be set to the same value as the Data transfer field (except Off). **NOTE** When using NMEA output without the optional RTCM/NMEA splitter cable, the RTCM input (see page 19-41) must be set to Off or Cable-free BoB.	Off

Use this field ...	to ...	Default value
Input baud rate	specify the baud (see Glossary-3) rate for input of RTCM data. Items in the pop-up list are: • 110 • 9600 • 300 • 19200 • 600 • 38400 • 1200 • 2400 • 4800	2400
Output baud rate	specify the baud rate for output NMEA data. Items in the pop-up list (see page 15-47) are: • 110 • 9600 • 300 • 19200 • 600 • 38400 • 1200 • 2400 • 4800	2400

The Setup Tab
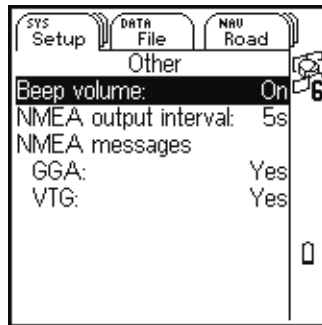
Use this field …	to …	Default value
Data bits	specify the number of data bits used to transfer data. When data is transferred, each character is sent in a stream of single bits, but many devices transmit or receive fewer than eight bits when transferring a single character. This field is the same for data input and data output. Items in the pop-up list are: • 7 • 8	8
Stop bits	specify the number of stop bits used to indicate the end of a byte. Stop bits are part of the data that is transferred. When data is transferred, each character is sent in a stream of single bits. There are eight bits in a byte and a stop bit is used to indicate the end of a byte. This field is the same for data input and data output. Items in the pop-up list (see page 15-47) are: • 1 • 2	1

Use this field …	to …	Default value
Parity	specify the parity (see Glossary-15) used when binary digital data is transferred. For most data transfers, select the same parity as is set in the external communication device. This field is the same for data input and data output. Items in the pop-up list are: • None • Even • Odd	None

The Setup Tab

Other

$\boxed{\text{SYS}}$ / **Setup** / **Configurations** / **Other**

Select the Other button from the Edit configuration screen. The Other form appears:

Use this form to set the parameters for the beep volume, and to configure the GeoExplorer 3 data collection system for NMEA output messages.

Press $\boxed{\text{CLOSE}}$ to close the Other form.

These fields are available in the Other form:

- Beep volume, page 19-47
- NMEA output interval, page 19-47

NMEA messages:

- GGA, page 19-47
- VTG, page 19-47

The Setup Tab

Use this field …	to …	Default value
Beep volume	specify whether the GeoExplorer 3 handheld emits a beep. Items in the pop-up list (see page 15-47) are: • On – any warnings or position logging cause the GeoExplorer 3 to beep. • Off – the GeoExplorer 3 does not beep.	On
NMEA output interval	specify the output interval at which NMEA (see page -14) messages are transmitted. This is a Numeric entry (see page 15-44) field.	5 s
GGA	specify if the GGA message (see Glossary-10) string is to be output in the NMEA message. Items in the pop-up list are: • Yes • No	Yes
VTG	specify if the VTG message (see Glossary-18) string is to be output in the NMEA message. Items in the pop-up list (see page 15-47) are: • Yes • No	Yes

The Setup Tab

19.2   Data Dictionaries

(SYS) / **Setup** / **Data dictionaries**

Use this list to edit an existing data dictionary or create a new one. You can create new data dictionaries that are specific to different jobs. Use the GeoExplorer 3 data collection system in the field, or the GPS Pathfinder Office software in the office, to create or edit a data dictionary.

Select Data dictionaries from the Setup tab. The Select data dictionary list appears:

To edit an existing data dictionary, select it from the list. The Edit Data Dictionary (see page 19-51) form appears.

Press (CLOSE) to close the Select data dictionary list.

Press (OPTION) to display the advanced Data Dictionaries Option List (see page 19-49).

NOTE   Data dictionaries are listed in the order in which they were created. The most recently created file is at the bottom of the list.

19.2.1 Data Dictionaries Option List

$\boxed{\text{SYS}}$ / **Setup** / **Data dictionaries** / $\boxed{\text{OPTION}}$

Press $\boxed{\text{OPTION}}$ from the Select data dictionary list to view the available options.
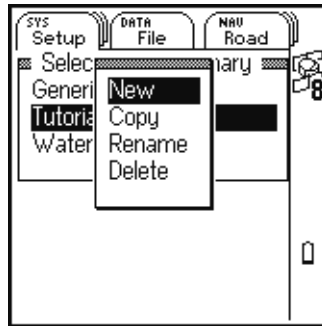
The options are:

- New, page 19-50   • Copy, page 19-50   • Rename, page 19-50

- Delete, page 19-50

The Setup Tab

Use this option …	to …
New	create a new data dictionary. When you select this option, the GeoExplorer 3 data collection system displays a text entry (see page 15-37) field. Enter the name of the new data dictionary. Press (CLOSE) to save the name and go to the Edit Data Dictionary (see page 19-51) form.
Copy	copy a data dictionary. Highlight the data dictionary to be copied. Press (OPTION) and select Copy. The GeoExplorer 3 displays a text entry field. Accept the default name or change it. The default name is Copy of <Data dictionary>. Press (CLOSE) to save the name and go to the Edit data dictionary form.
Rename	change the name of an existing data dictionary. Highlight the data dictionary to be renamed. Press (OPTION) and select Rename. A text entry field appears. Change the name of the data dictionary. Press (CLOSE) to save the new name.
	NOTE The Rename and Delete options do not appear if Generic is highlighted in the list. You cannot rename or delete the generic data dictionary.
Delete	delete a data dictionary. Highlight the data dictionary to be deleted. Press (OPTION) and select Delete. You are prompted to confirm deletion.
	NOTE You cannot delete a data dictionary that is in use, or has been used by a file that is currently stored on the GeoExplorer 3.

NOTE   If the dictionary name that you enter already exists, a warning message appears. You cannot create multiple data dictionaries with the same name.

The Setup Tab

19.2.2 Edit Data Dictionary

(SYS) / **Setup** / **Data dictionaries** / **<Data dictionary name>**

Select a data dictionary from the list of available dictionaries on the GeoExplorer 3. The Edit data dictionary form displays the comment, features, attributes, and values contained in the selected data dictionary.

Use this form to view information about adding or editing the features, attributes, and values in the selected data dictionary.

Press (CLOSE) to close the Edit data dictionary form and save any changes. Press (Fn)(CLOSE) to close the Edit data dictionary form and abandon any changes.

Press (OPTION) to view the Edit data dictionary option list (see page 19-52).

To edit the Comment field, select it. A Text entry (see page 15-37) field appears. Enter your comment. The Comment field is for reference only and it is optional.

To edit a feature, attribute, or value select it from the list. The appropriate attribute entry form or pop-up list (see page 15-47) appears. Enter the changes.

NOTE   If a data file is open, you can add to the end of its associated dictionary, but not delete or change any features, attributes, or values. For more information, see Dictionary, page 21-5.

The Setup Tab

Edit data dictionary option list
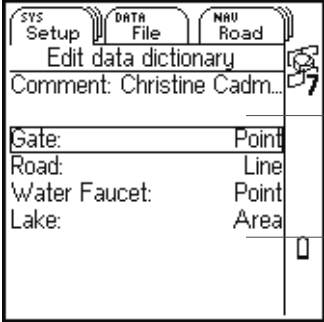
(SYS) / **Setup** / **Data dictionaries** / **<Data dictionary name>** / (OPTION)
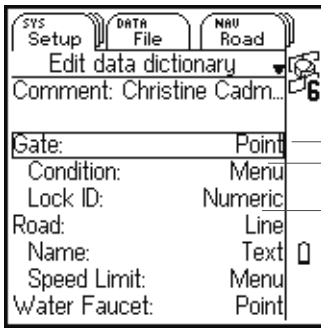
From the Edit data dictionary form, press (OPTION) to view the available options. The options that appear depend on what is currently displayed in the Edit data dictionary form.
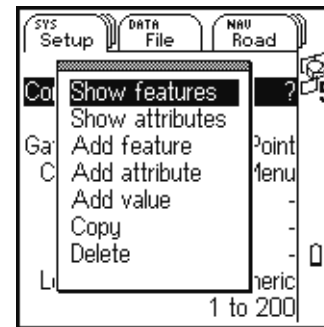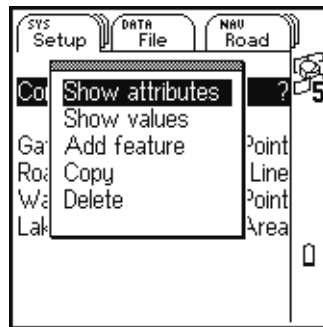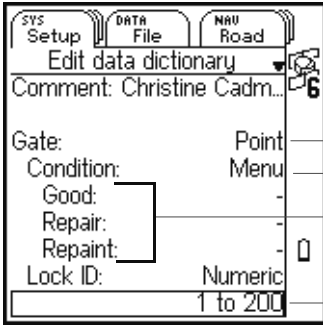
The options are:

- Show features, page 19-53

- Add feature, page 19-55

- Copy, page 19-58

- Show attributes, page 19-54

- Add attribute, page 19-56

- Delete, page 19-59

- Show values, page 19-55

- Add value, page 19-58

Use this option …	to …
Show features	display the features and feature types that occur in the selected data dictionary. This option is only available if attributes or values are currently displayed. Select this option to hide attributes and values, and display only features and feature types.

Features and their corresponding type

NOTE   When you first open a data dictionary, Show features is the default option.

The Setup Tab

Use this option …	to …
Show attributes	display the features, feature types, attributes, and attribute types associated with each feature. Attributes are indented to show which feature they belong to.

Feature and corresponding type

Attributes and corresponding type for the above feature

Use this option …	to …
Show values	display the values associated with each attribute. Values are indented to show which attribute they belong to.

Feature and corresponding type
Attribute and corresponding type
Values for the menu attribute
Maximum and minimum range for the numeric attribute

Add feature	add a feature to the current data dictionary. When you select this option a feature is added below the selected feature. When a new feature is created, the prefix for the name is New and the suffix is a digit number (starting at 1 for the first one created), for example, New1, then New2, and so on. To edit the name, select it. A Text entry (see page 15-37) field appears. By default, the new feature is a point. To edit the feature type, select it. A Pop-up list (see page 15-47) appears.

Use this option …	to …
Add attribute	add an attribute to the current data dictionary. This option is only available when attributes are displayed. When you select this option, an attribute is added below the selected attribute. When a new attribute is created, the prefix for the name is New and the suffix is a digit number (starting at 1 for the first one created), for example, New1, then New2, and so on. To edit the name, select it. A Text entry (see page 15-37) field appears. By default, the new attribute is a text entry attribute. To edit the attribute type, select it. A pop-up list (see page 15-47) appears. The attribute types are: • **Menu** – use the Add value option to create a list of values. To set a menu value as the default, highlight it and press ⬭ENTER. Only one value can be set as the default.

Use this option …	to …
Add attribute (continued)	• **Numeric** – use the Definition form to define the numeric attribute. Select the value field and press (OPTION). Select Show values from the option list and then select the value field. The Definition form appears:

Use this form to specify the type of field entry on creation and on update, the maximum and minimum default values, and the number of decimal places for the numeric attribute.

```
┌─────────────────────────┐
│ ⌐SYS  ⌐DATA  ⌐NAU      │
│  Setup   File   Road    │
│   Definition of New 2   │
│ Entry on create:  Normal│
│ Entry on update:  Normal│
│ Default:              0  │
│ Maximum:     100000000  │
│ Minimum:             0  │
│ Decimal Places:      0  │
│                         │
└─────────────────────────┘
```

Use this option …	to …
Add attribute (continued)	• Text – use the Definition form to define the text attribute. Select the <-no.-> value. The Definition form appears. Specify the type of field entry and the maximum number of characters allowed. • Date – use the Definition form to define the Date attribute. Select the DD/MM/YYYY (Manual) value. The Definition form appears. Specify the type of field entry, the auto generate options, and the format. • Time – use the Definition form to define the Time attribute. Select the 12 hour (Manual) value. The Definition form appears. Specify the type of field entry, the 24 hour option, and the auto generate options. • Separator – use this attribute type to annotate or create a break in the list of attributes. A separator is not an attribute, and you cannot enter a value for it.
Add value	add a value to a menu attribute. This option is only available when values are displayed. When you select this option, a value is added below the selected value. When a new value is created, the prefix for the name is New and the suffix is a digit number (starting at 1 for the first one created), e.g. New1, then New2, and so on. To edit the value, select it. The appropriate field appears.
Copy	copy a feature, attribute, or value. Highlight the feature, attribute, or value that you want to copy. Press ⬭OPTION⬭ and select Copy. The new feature, attribute, or value appears at the bottom of the appropriate list. The default name is Copy of <feature / attribute / value>.

The Setup Tab

Use this option …	to …
Delete	delete a feature, attribute, or value. Highlight the feature, attribute, or value to delete. Press (OPTION) and select Delete. You are prompted to confirm the deletion. **NOTE** You cannot delete from a data dictionary any features, attributes, or values that are used by data files on the GeoExplorer 3.

The Setup Tab

19.3 Feature Settings

(SYS) / **Setup** / **Feature settings**

Use the Select feature settings list to edit an existing feature setting or to create a new one. Use it to set logging intervals and minimum positions. These are critical parameters, so configure them to suit your application. You can also use the Select feature settings list to configure carrier phase data collection and offsets.

Select Feature settings from the Setup tab. The Select feature settings list appears:

This list reflects the data dictionaries currently stored in the GeoExplorer 3. To edit the feature settings for a data dictionary, select it from the list. The Edit Feature Settings (see page 19-61) form appears.

Press (CLOSE) to close the Select feature settings list.

The Setup Tab

19.3.1 Edit Feature Settings

(SYS) / **Setup** / **Feature settings** / **<Feature name> settings**

The Edit feature settings list displays the feature name and the logging interval for every feature in the current data dictionary.
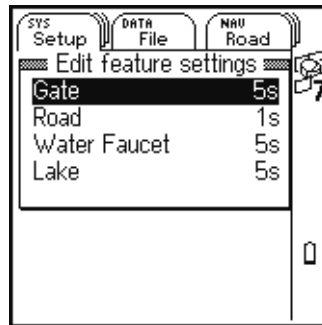
Use this list to view information about the settings for the features in the current data dictionary.

Press (CLOSE) to close the Edit feature settings list.

Press (OPTION) to view the Edit feature settings option list (see page 19-71).

To edit the setting for a feature, select the feature from the list. The form that appears depends on what type of feature you select—point, line, or area.

- Editing point features, page 19-62
- Editing line and area features, page 19-65

Editing point features

When you select a point feature from the Edit feature settings list, the <Feature name> settings form appears. The name of the selected point feature is at the top of the screen.
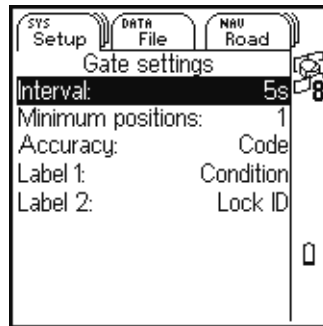
Use this form to set or change the parameters for the selected point feature. The parameters affect the GPS positions collected for that feature, and the information displayed in the DATA section when the feature is selected.

Press (CLOSE) to close the <feature name> settings form.

These fields are available in the <feature name> settings form:

- Interval, page 19-63
- Minimum positions, page 19-63
- Accuracy, page 19-63

- Label 1, page 19-64
- Label 2, page 19-64

Press (OPTION) to display the <feature name> settings option list. This list contains one option, Auto-increment. Select this option to display the Auto-increment settings form (see page 19-68).

The Setup Tab

Use this field ...	to ...	Default value
Interval	specify the interval between feature GPS positions when you are collecting a point feature. For example, if you set the interval to five seconds, the GeoExplorer 3 logs GPS positions once every five seconds, from when you start the feature until you end it. This is a numeric entry (see page 15-44) field or you can select Off.	5 s
Minimum positions	specify the minimum number of positions that must be logged. If you try to save a point feature before enough positions are logged, the GeoExplorer 3 warns you. You can store the feature anyway despite a possible loss of precision, or you can stay at the feature until enough positions are logged. This is a numeric entry field.	1
Accuracy	specify whether you want to collect code or carrier phase data for point features. Items in the Pop-up list (see page 15-47) are: • Code • Carrier For more information, see Carrier Phase Data Collection, page 12-1.	Code

The Setup Tab

Use this field …	to …	Default value
Label 1	specify the first feature information label to be displayed in The Map Tab, page 24-1 and in the Update feature list in The Update Tab, page 23-1. Items in the Pop-up list (see page 15-47) are the attributes of the selected feature, as well as the value Off which you can select to hide this label.	The first attribute of the feature, or the attribute selected in the Data Dictionary Editor utility.
Label 2	specify the second feature information label. Items in the Pop-up list (see page 15-47) are the attributes of the selected feature, as well as the value Off which you can select to hide this label.	The second attribute of the feature, or the attribute selected in the Data Dictionary Editor utility.

Editing line and area features

When you select a line or area feature from the Edit feature settings list, the <Feature name> settings form appears. The name of the selected feature is at the top of the screen.

```
┌─SYS──┬─DATA──┬─NAV──┐
│Setup │ File  │ Road │
├──────┴───────┴──────┤
│    Road settings    │⟨⟩
│Interval:        1s│⬚6
│Accuracy:        Code│
│Offset               │
│ Direction:      Right│
│ Horz. distance: 0.00m│
│ Vert. distance: 0.00m│
│Label 1:         Name □│
│Label 2: Speed Limit (mph)│
└─────────────────────┘
```

Use this form to set the line or area feature parameters for the selected feature. These parameters affect the GPS positions collected for that feature. You can also use this form to configure offsets (see page 11-8) and to specify the information displayed when the feature is selected in the DATA section.

Press (CLOSE) to close the <feature name> settings form.

These fields are available in the <feature name> settings form:

- Interval, page 19-66
- Accuracy, page 19-66
- Label 1, page 19-64

- Label 2, page 19-64

Offset:

- Direction, page 19-67
- Horz. distance, page 19-67
- Vert. distance, page 19-67

Press (OPTION) to display the <feature name> settings option list. This list contains one option, Auto-increment. Select this option to display the Auto-increment settings form (see page 19-68).

Use this field …	to …	Default value
Interval	specify the interval (time or distance) between feature GPS positions when you are collecting a line or area feature. For example, if you set the interval to five seconds, the GeoExplorer 3 logs GPS positions once every five seconds, from when you start the feature until you end it. This is a numeric entry (see page 15-44) field or you can select Off.	5 s
Accuracy	specify whether you want to collect code or carrier phase data for line and area features. Items in the Pop-up list (see page 15-47) are: • Code • Carrier For more information, see Carrier Phase Data Collection, page 12-1.	Code

Use this field ...	to ...	Default value
Offset Direction	specify the direction to the line or area feature. The direction is relative to the direction of travel at the time the feature is recorded. Items in the Pop-up list (see page 15-47) are: • Right • Left	Right
Horz. distance	specify the horizontal distance to the line or area feature.	0.00 m
Vert. distance	specify the vertical distance to the line or area feature.	0.00 m
Label 1	specify the first feature information label to be displayed in The Map Tab, page 24-1 and in the Update feature list in The Update Tab, page 23-1. Items in the Pop-up list (see page 15-47) are the attributes of the selected feature, as well as the value Off which you can select to hide this label.	The first attribute of the feature, or the attribute selected in the Data Dictionary Editor utility.
Label 2	specify the second feature information label. Items in the Pop-up list (see page 15-47) are the attributes of the selected feature, as well as the value Off which you can select to hide this label.	The second attribute of the feature, or the attribute selected in the Data Dictionary Editor utility.

The Setup Tab

Auto-increment settings form

<kbd>SYS</kbd> / **Setup** / **Feature settings** / **Edit feature settings** / **<Feature> settings** /
<kbd>OPTION</kbd> / **Auto-increment**

Any numeric or text attribute can be defined as auto-incrementing. When you create a new feature, any auto-incrementing attributes are automatically filled in with the next value in the sequence. The new value is based on the step value that you specify in the Auto-increment settings form and the last value entered in the field. The sequence can increase or decrease, and may advance in any increment (step) value, provided this value is within the acceptable range for the attribute. For example, if an attribute has a value of 10 and an increment value of 5, the next value automatically generated is 15.

For more information on how values are incremented, see Auto-incrementing attributes, page 19-70.

To set auto-incrementing options for the selected feature type, press <kbd>OPTION</kbd> in the <feature> settings form and select Auto-increment:
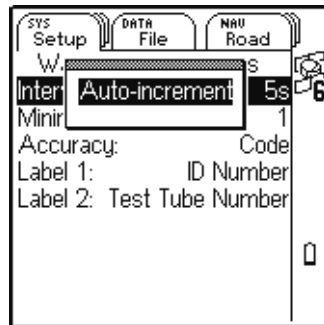
The Auto-increment settings form appears

This form contains a field for each text or numeric attribute in the feature. A field is set to No increment if it does not have automatic incrementing enabled, or to a positive or negative value that indicates the step by which the values in this field increment.

To change an attribute's auto-increment setting, highlight the corresponding field in the form and press (ENTER). The Increment form appears. To turn off auto-incrementing, select No increment. To turn auto-incrementing on, or to change the increment value, select Step value and enter a value in the Numeric entry (see page 15-44) or Text entry (see page 15-37) field.

You can set auto-incrementing values for attributes either on the GeoExplorer 3 handheld, or in the Data Dictionary Editor utility in the GPS Pathfinder Office software. For more information, refer to the GPS Pathfinder Office Help.

Auto-incrementing attributes

Although you can define a text attribute as an auto-incrementing attribute, only numeric values within the text are incremented or decremented. For example, if the last value you entered was 47A, and the step value is 1, the next value generated by the GeoExplorer 3 is 48A. However, if the last value was A, the next is still A, as there is no numeric component to increment.

When the text consists of more than one number interspersed with alphabetic characters, only the last numeric part of the string is incremented. For example, A100-K9 with a step value of 1 is incremented to A100-K10.

As with any other default value, you can edit an auto-incremented value if it is not acceptable. However, if you edit an auto-incremented value, the next value in the sequence is calculated using the new value you entered, not the original value generated by the system.

If any condition prevents the GeoExplorer 3 from generating the next value in the sequence, the attribute is created with a null value represented by a "?". This occurs when:

- the feature is the first of its type to be created in this file, and no default value is specified
- the last value for the attribute was blank
- the last value was the maximum value in the range and the sequence is incrementing
- the last value was the minimum value in the range and the sequence is decrementing

Edit feature settings option list

(SYS) / **Setup** / **Feature settings** / **Edit feature settings** / (OPTION)

Press (OPTION) from the Edit feature settings list to view the available options. Use these options to make the same change to all features of a particular type.
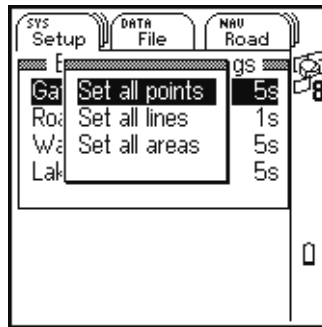
The options are:

- Set all points, page 19-72
- Set all lines, page 19-72
- Set all areas, page 19-72

Use this option ...	to set the parameters for all ...
Set all points	point features in a data dictionary. When you select this option, the Set all points form appears. Use it to change the settings for all point features. Press (CLOSE) to accept any changes and close the form. Press (Fn)(CLOSE) to close the form and abandon any changes.
Set all lines	line features in a data dictionary. When you select this option, the Set all lines form appears. Use it to change the settings for all line features. Press (CLOSE) to accept any changes and close the form. Press (Fn)(CLOSE) to close the form and abandon any changes.
Set all areas	area features in a data dictionary. When you select this option, the Set all areas form appears. Use it to change the settings for all area features. Press (CLOSE) to accept any changes and close the form. Press (Fn)(CLOSE) to close the form and abandon any changes.

The Setup Tab

19.4   About

(SYS) / **Setup** / **About**

Select the About button from the Setup tab. The About screen appears:
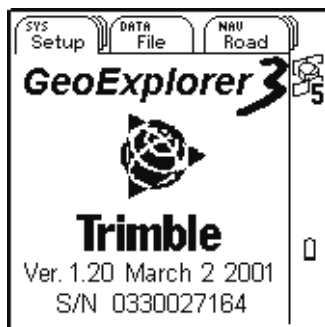
Use this screen to view information about the firmware. It displays the following information:

- Product name
- Trimble logo and company name

- Version number and release date
- Serial number

19.5   Reset

⬭ SYS / **Setup** / **Reset**

Use the Reset list to reset the GeoExplorer 3 to factory defaults, reset the internal GPS receiver, or to prepare the GeoExplorer 3 for a firmware upgrade. Select Reset from the Setup tab. The reset list appears:
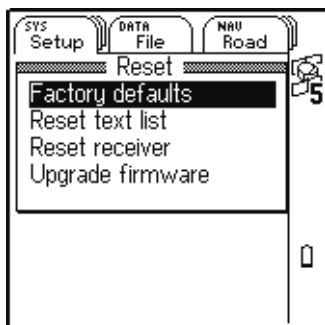
The options are:

- Factory Defaults, page 19-75
- Reset Text List, page 19-76
- Reset Receiver, page 19-77
- Upgrade Firmware, page 19-78

19.5.1 Factory Defaults

(SYS) **/ Setup / Reset / Factory defaults**

Select Factory defaults from the Reset list. The following screen appears:
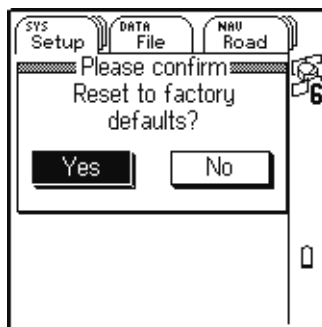
Use this screen to reset the firmware to Trimble factory defaults.

You are prompted to confirm the reset. If you select:

- Yes – the GeoExplorer 3 firmware resets to the factory defaults.
- No – the reset operation is cancelled.

NOTE Resetting to factory defaults does not delete data dictionaries, data files, languages, coordinate systems, or waypoints. However, it does reset the GeoExplorer 3 to the default language (English), the default coordinate system (latitude/longitude on the WGS-84 datum), and the default data dictionary (Generic). Any open data files will be closed.

19.5.2 Reset Text List

(SYS) / **Setup** / **Reset** / **Reset text list**

Use the Reset text list option to clear the list of strings that is used for Text completion (see page 15-42). Select Reset text list from the Reset list.
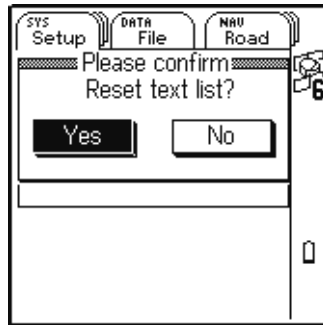
You are prompted to confirm the reset. If you select:

- Yes – the list of text completion strings is cleared.
- No – the reset operation is cancelled.

NOTE   You can remove individual strings from the list during text entry. For more information, see Text completion, page 15-42.

19.5.3 Reset Receiver

(SYS) / **Setup** / **Reset** / **Reset receiver**

Use the Reset receiver option to reset the receiver. Select Reset receiver from the Reset list. The reset receiver screen appears:
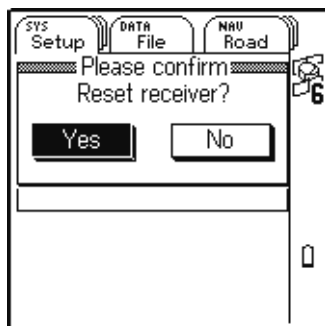
Use this screen to reset the receiver.

You are prompted to confirm the reset. If you select:

• Yes – the GeoExplorer 3 receiver is reset.

• No – the reset operation is cancelled.

NOTE   Normally it is unnecessary to reset the GeoExplorer 3 internal GPS receiver, but, if for some reason the receiver malfunctions, resetting it can often fix the problem.

CAUTION   Resetting the internal GPS receiver will delete the current almanac and perform a warm boot. The receiver may take up to three minutes to reacquire signals from the GPS satellites. If the GeoExplorer 3 fails to acquire GPS satellite signals within three minutes, you should contact your Trimble Dealer for advice.

NOTE   Although resetting the receiver deletes the almanac file, it does not affect any other files or settings on the GeoExplorer 3.

The Setup Tab

19.5.4 Upgrade Firmware

(SYS) / **Setup / Reset / Upgrade firmware**

Use the Reset list to prepare the GeoExplorer 3 for a firmware upgrade. Select Upgrade firmware from the Reset list. The Upgrade firmware screen appears:
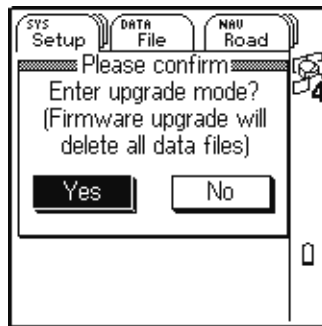
Use this screen to begin the firmware installation process.

You are prompted to confirm the reset. If you select:

•   Yes – the GeoExplorer 3 is placed in Upgrade mode.

For more details, see INSTALLING THE FIRMWARE, page 31-1.

•   No – the upgrade operation is cancelled.

WARNING   Upgrading the firmware deletes all data files, waypoints, configuration settings, data dictionaries, user-loaded languages, and coordinate systems.

20 THE DATA SECTION

Use the DATA section to open data files, collect new data, update existing data, and view GPS data graphically.

Press ⬭DATA to move between the tabs in the DATA section.

The DATA section has four tabs:

- The File Tab, page 21-1
- The New Tab, page 22-1
- The Update Tab, page 23-1

- The Map Tab, page 24-1

NOTE   The New, Update, and Map tabs are visible only when a data file is open.

NOTE   The Map tab is not available with the GeoExplorer 3c Edition (see page 2-5).

21 The File Tab

DATA / **File**

To display the File tab, press **DATA** .The File tab appears if no data file is open. (When a data file is open the File tab is not available.) The Collect new data form appears:

Use this tab to create a new data file or open an existing one. Use it to change a filename and select the data dictionary that you want to use.

Press **OPTION** to view the File Option List (see page 21-6).

When the Create new file button is highlighted, the name of the current form changes to Collect new data. Use this form to create a new data file.

The Collect new data form contains:

- Create new file,
  page 21-3

- Open selected file,
  page 21-3

- File, page 21-4

- Dictionary, page 21-5

When the Open selected file button is highlighted, the name of the current form changes to Update existing data. Use this form to open an existing data file.

In addition to the fields that are available in the Collect new data form, the Update existing data form contains:

- File size, page 21-5

- Time, page 21-5

- Date, page 21-5

Use this button …	to …
Create new file	create a new rover data file. When the Create new file button is highlighted, the Collect new data form appears. When all fields in the form are correct, press (ENTER). This accepts the new File (see page 21-4) name and Dictionary (see page 21-5). A new rover data file is created and The New Tab (see page 22-1) appears.
Open selected file	open a selected rover data file. When the Open selected file button is highlighted, the Update existing data form appears. Use the File field to select the file to be opened. Press (ENTER). The Update tab appears.
	The data dictionary associated with the file is the data dictionary that was selected when that file was created.
	NOTE If a data file was created more than seven days ago, the GeoExplorer 3 data collection system will not let you reopen it for further logging of data (although you can review and edit it). This technical limitation relates to the way in which GPS times are stored. To maintain accurate storage, it is necessary to limit the time-span of a data file to seven days.

The File Tab

Use this field …	to …
File	edit the filename, or select an existing file to open. When Create new file is highlighted, press ⏎ENTER to edit the filename.
	When Open selected file and the File field are highlighted, press ⏎ENTER to see a list of the files stored in the GeoExplorer 3 handheld. Status information for the selected file in the list, including the number of point, line, and area features and the file's transfer status, appears below the list.
	The GeoExplorer 3 automatically generates a filename for new files. It uses the following formula: R MM DD HH X where:
	• R is the Filename prefix (see page 19-8),
	• MM is the current UTC month,
	• DD is the current UTC day of the month,
	• and HH is the current UTC hour of the day.
	X increments within this hour, starting at "A" for the first file in that hour, then "B" for the second file, and so on.
	NOTE The auto-generated filename is only a suggestion. You can alter the suggested name or enter a new name. Filenames must be not more than 20 characters long.

Use this field ...	to ...
Dictionary	select a data dictionary from the list of data dictionaries currently loaded on the GeoExplorer 3 data collection system. When Create new file is highlighted, the default data dictionary is the one most recently loaded to the GeoExplorer 3 using the GPS Pathfinder Office software. To select a dictionary, highlight the Dictionary field and press ⬭ENTER. The list of available dictionaries appears.
	The "Generic" data dictionary is always available. It lets you record point, line, and area features, each with a simple descriptive attribute.
	You can use the GeoExplorer 3 to edit and create Data Dictionaries (see page 19-48).
	When Open selected file is highlighted, this field is read-only and shows the name of the data dictionary associated with the selected file.
	NOTE The data dictionary selected when creating a data file is permanently associated with that file. It determines which types of features can be recorded to the file, and what attributes the features have.
	NOTE When a file is on the GeoExplorer 3, you can only add to the associated data dictionary. You cannot make changes to existing items, or delete items from it.
File size	view the size, in kilobytes, of the selected data file.
Time	view the time when the file was last updated.
Date	view the date when the file was last updated.

The File Tab

21.1   File Option List

(DATA) / **File** / (OPTION)

When the File tab is active, press (OPTION) to display the available options.
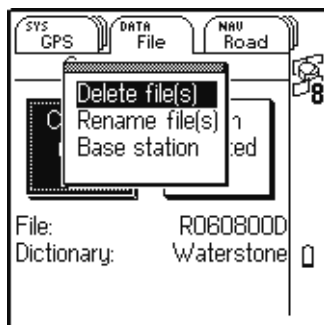
The options are:

- Delete File(s), page 21-7
- Rename File(s), page 21-10
- Base Station, page 21-11

21.1.1 Delete File(s)

[DATA] / **File** / [OPTION] / **Delete file(s)**

Select Delete file(s) from the File option list. The Delete file(s) list appears:

```
┌─────────────────────────────┐
│ ⌐SYS⌐ ⌐DATA⌐ ⌐NAV⌐          │
│  GPS   File   Road          │
│ ═══ Delete file(s) ═══   ⌐▢⌐ │
│ R021622B              ⌐⌐8   │
│ R021622A                    │
│ R021622C                    │
│                             │
│                             │
│ ■17    ~3     ♡8      x0    │
│ 908.1KB free  Not transferred │
│ 3.5KB         Waterstone    │
│ 09:02:37 am   09/22/2000    │
└─────────────────────────────┘
```

List of rover and base files

Message box
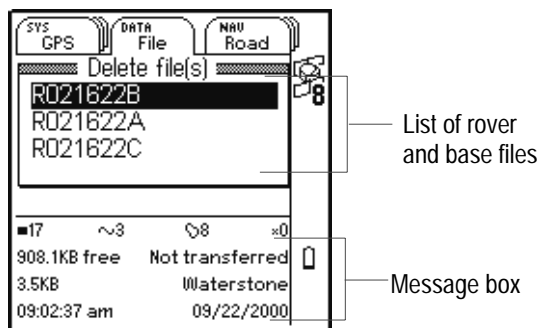
Use this list to delete rover and base data files. To delete a file, highlight it and press [ENTER]. You are prompted to confirm the deletion.

Press [OPTION] to display the Delete all file(s) option.

The Delete file(s) screen displays the following:

- List of files, page 21-8
- Points, page 21-8
- Lines, page 21-8
- Areas, page 21-8
- Between feature GPS, page 21-8
- Free space, page 21-8
- Status, page 21-8
- File size, page 21-8
- Data dictionary, page 21-8
- Time, page 21-8
- Date, page 21-8

Information	Description
List of files	Use this list to select the file(s) to be deleted or renamed. Information about the highlighted file is displayed in the message box. As you scroll through the list of files, the displayed information changes accordingly.
Points	The point symbol (■), with the number of point features in the selected file.
Lines	The line symbol (∿), with the number of line features in the selected file.
Areas	The area symbol (⬠), with the number of area features in the selected file.
Between feature GPS	The Between feature GPS symbol (⁎), with the number of GPS positions recorded between features in the selected file.
Free space	The amount of free space in kilobytes (KB) remaining in the GeoExplorer 3 data collection system.
Status	Indicates whether the highlighted file has been transferred from the GeoExplorer 3 data collection system to an office computer.
File size	The size of the highlighted file in kilobytes (KB).
Data dictionary	The name of the data dictionary the selected file is associated with.
Time	The time when the file was last updated.
Date	The date when the file was last updated.

Delete file(s) option list

(DATA) / **File** / (OPTION) / **Delete file(s)** / (OPTION)

Press (OPTION) from the Delete file(s) list to display the Delete all files option.
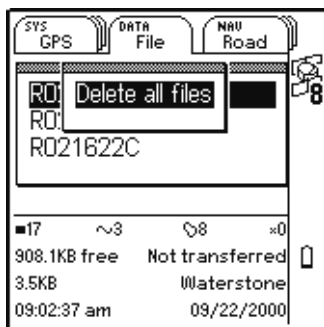
Use the Delete all files option to delete all rover and base files from the GeoExplorer 3 handheld. You are prompted to confirm the deletion. The GeoExplorer 3 displays a warning when you delete files that have not been transferred to the office computer.

21.1.2 Rename File(s)

⬭DATA⬭ / **File** / ⬭OPTION⬭ / **Rename file(s)**

Select Rename file(s) from the File option list. The Rename file(s) list appears:
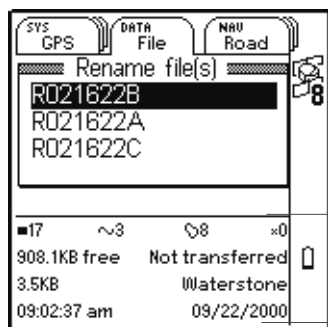
Use this list to rename rover and base data files. To rename a file, highlight it and press ⬭ENTER⬭. The Text entry (see page 15-37) field appears, displaying the current filename.

——— Message box

The Rename file(s) screen displays the following:

- List of files, page 21-8
- Points, page 21-8
- Lines, page 21-8

- Areas, page 21-8
- Between feature GPS, page 21-8
- Free space, page 21-8

- Status, page 21-8
- File size, page 21-8
- Data dictionary, page 21-8

- Time, page 21-8
- Date, page 21-8

21.1.3 Base Station

(DATA) / **File** / (OPTION) / **Base station**

Select Base station from the option list. The Collect base data form appears:

Use this form to create a new base file or open an existing one. A base station is used to collect base data. Base data is used by the GPS Pathfinder Office software to differentially correct rover files during post-processing.

For more information, refer to the GPS Pathfinder Office Help.

The Collect base data form displays the following:

- Create new file, page 21-14
- Open selected file, page 21-20
- File, page 21-21

When the Create new file button is highlighted, the Configuration field appears.

The GPS configuration settings for base stations are pre-configured as follows:

- PDOP Mask = 10

- SNR Mask = 2

- Elevation Mask = 0

NOTE   These cannot be altered. The GPS slider settings have no effect on the base station GPS settings.

When the Open selected file button is highlighted, the following fields appear:

- File size, page 21-13   • Free space, page 21-13   • Time, page 21-13

- Date, page 21-13

NOTE   The Open selected file button only appears if there are base files in the GeoExplorer 3 data collection system.

Plan carefully for the roving unit(s) and the base station. Make sure the base station is recording data at the same time that the roving unit is recording positions. The satellites tracked by the rover must be included among the satellites tracked by the base station.

The further a rover is from the base station, the greater the risk that it will track a satellite that the base station cannot see. Think about potential obstructions such as hills or buildings that can block a satellite signal to the base station.

While the GeoExplorer 3 handheld is logging data to a base station file, you cannot create a new rover data file or open an existing one.

NOTE The GeoExplorer 3 data collection system automatically uses 12 channels to receive GPS signals when you use it as a base station.

Field	Description
File size	The size, in kilobytes, of the selected data file.
Free space	The amount of free space, in kilobytes, on the GeoExplorer 3 handheld.
Time	The time when the file was last updated.
Date	The date when the file was last updated.

Create new file

DATA / **File** / OPTION / **Base station**

To create a new base data file with the name indicated in the File field, select the Create new file button. The Base station form appears:

Use this form to enter the base station reference position and the logging information that controls how the GeoExplorer 3 logs base station data.

Press LOG to start Logging base file data (see page 21-18).

Press OPTION to view the Base station option list (see page 21-22).

The following fields are available in the Base station form:

- Lat, page 21-16
- Lon, page 21-16
- Altitude, page 21-16

- Antenna height, page 21-16
- Measurements, page 21-17

When you create a new base file the GeoExplorer 3, by default, automatically uses the last reference position entered. If no position has been entered, Lat, Lon, and Altitude values appear as "?".

If you provide a reference position for the base station, you must enter values for all position fields (Lat, Lon, and Altitude).

You can enter the reference position from a map, or from the results of a previously conducted control survey.

TIP   For greatest accuracy, make sure that the position logging interval for each GPS rover is an exact multiple of the measurement logging interval at the base station. If you set the position logging interval to a value that is not an exact multiple of the base station's measurement logging interval, the differential correction program has to compute interpolated differential corrections. These are less accurate than those computed when the logging intervals of the base station and rover(s) are synchronized.

The File Tab 21

Use this field...	to ...	Default value
Lat	enter the latitude of the base station. This is a Numeric entry (see page 15-44) field.	Last value entered
Lon	enter the longitude of the base station. This is a numeric entry field.	Last value entered
Altitude	enter the altitude of the base station. This is a numeric entry field and displays in MSL or HAE, depending on the configured altitude reference.	Last value entered
Antenna height	enter the antenna height. This is a Numeric entry field. **NOTE** It is important that you enter the antenna height correctly, as the GPS Pathfinder Office software uses this height to transform the reference position (on the ground) into the position of the GPS receiver's antenna phase center (APC). This APC is used by the Differential Correction utility in the GPS Pathfinder Office software.	Last value entered

Use this field...	to ...	Default value
Measurements	enter the measurement logging interval of the base station. The primary task of a GPS base station is to log raw GPS measurements from satellites for use when differentially correcting rover files. To provide accurate differential corrections, raw measurements should be logged reasonably often. The maximum permitted measurement logging interval is 30 seconds. You can reduce the interval to a minimum of one second, but this will result in up to 30 times as much data being logged by the GeoExplorer 3. The default setting of 15 s provides a good compromise between the quality of postprocessed positions and the storage space and processing time required.	15 s

The File Tab

Logging base file data

To start logging base file data, press ⬭LOG. Logging information is displayed in the message box.

Message box
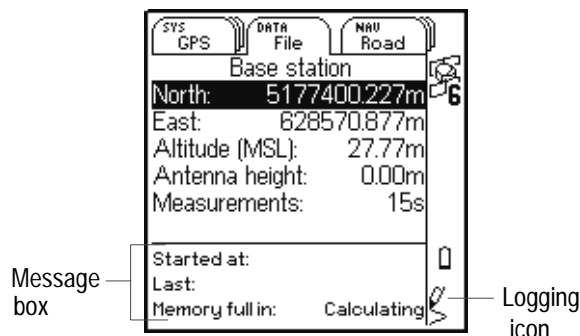
Logging icon

The message box at the bottom of the screen displays information about the base file. The logging icon appears in the Status Bar (see page 15-13). It indicates how many GPS positions have successfully been logged to the file.

The message box displays the following:

- Started at, page 21-19
- Last, page 21-19
- Memory full in, page 21-19

To stop using the GeoExplorer 3 as a base station, press ⬭CLOSE⬭. You are prompted to confirm that you want to stop logging base station data.
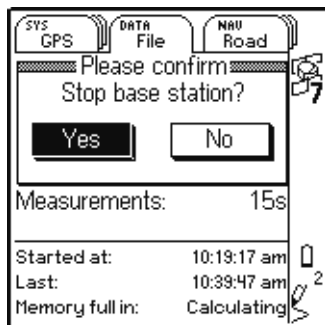
Information	Description
Started at	The time that the base station started logging to the data file.
Last	The time that the base station stopped logging to the data file.
Memory full in	The time remaining before the data storage space is full. This value is computed after every 10 measurements logged.

Open selected file

(DATA) / **File** / (OPTION) / **Base station**

To open an existing base file, highlight the Open selected file button in the Collect base data form. Select the File field and press (ENTER). A list of base files appears. Select the file to be opened and press (CLOSE). Highlight the Open selected file button and press (ENTER). The Base station form appears. Use this form to enter the base station reference position, antenna height, and measurement logging interval.

For more information about the Base station form, see Create new file, page 21-14.

NOTE   When you open an existing base file, the GeoExplorer 3 automatically uses the reference position that was entered when the file was created.

NOTE   Changing the reference position while logging a base file overwrites the previously entered reference position.

NOTE   The name of a configuration file that is used with the base data file is shown in the Configuration field. This field cannot be changed and the configuration cannot be edited.

File

⬭DATA⬭ / **File** / ⬭OPTION⬭ / **Base station**

Use the File field to change the name of a base data file, or to view the list of base data files currently loaded on the GeoExplorer 3 data collection system.

When the Create new file button is highlighted, the GeoExplorer 3 automatically generates a file name for a new base data file. It is uses the formula B MM DD HH X, where:

- B is the Filename prefix (see page 19-8)
- MM is the current UTC (see Glossary-17) month
- DD is the current UTC day of the month
- HH is the current UTC hour of the day

The X increments within this hour, starting at "A" for the first file in that hour, then "B" for the second file, and so on. For example, B052523C is the name assigned to the third file ("C") created on May 25th, between 2300 and 2400 hours.

The auto-generated file name is only a suggestion. You can change it or enter an entirely different name. To edit the file name, highlight the File field and press ⬭ENTER⬭. Use the
Text entry (see page 15-37) field that appears to change the filename.

When the Open selected file button is highlighted, select File. A list of base files appears. Use this list to select the file to be opened.

Base station option list

DATA / **File** / OPTION / **Base station** / OPTION

Press OPTION from the Base station form to display the available options.
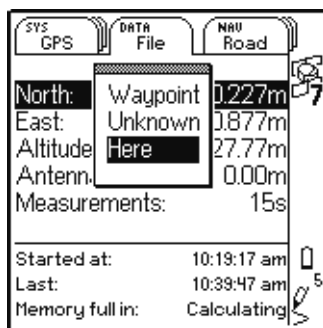
The options are:

- Waypoint, page 21-23
- Unknown, page 21-23
- Here, page 21-23

Use this option …	to …
Waypoint	automatically fill in the reference position fields with the location of a previously recorded waypoint. Select this option to display a list of waypoints. Use the list to select the waypoint that you want to assign as the base station reference position.
Unknown	assign null values to the base station reference position fields. **NOTE** You do not have to enter a reference position in the field, but a reference has to be entered in the Differential Correction utility in the GPS Pathfinder Office software.
Here	automatically fill in the reference position fields with the current GPS position (if any).

22 The New Tab

DATA / **New**

To display the New tab, press **DATA** until the New tab is active. If no data file is open,
The File Tab (see page 21-1) appears. If a data file is open, the New feature list appears:
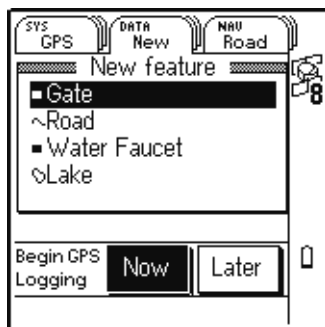
To start a new feature, press △ or ▽ to highlight it in the list.
Then press ◁ or ▷ to highlight the Now (see page 22-2) or
Later (see page 22-2) button, depending on when you want the
GeoExplorer 3 to start logging GPS positions for that feature.
Press **ENTER**. An attribute entry form appears. Use this form for
Entering Attribute Values (see page 22-3).

NOTE While you have a new feature open, you can switch
to the Update tab, open an existing feature, and update its
attribute data. For more information, see The Update Tab,
page 23-1.

Press **OPTION** to view the New Feature Option List (see page 22-9).

TIP Use the Advanced Datalogging Options (see page 11-2) function to start logging GPS positions
before selecting a feature.

Use this option …	to …
Now	start logging GPS positions for the selected feature. The selected feature and GPS data collection are started simultaneously. The logging icon appears in the Status Bar (see page 15-13) when the GeoExplorer 3 is logging GPS positions. The default for logging GPS positions is Now.
Later	open the feature with GPS logging paused. This lets you modify attribute values before GPS is added to the feature. You can also use the Later option when you want to begin a feature with an averaged vertex (for more information, see Averaged Vertices, page 11-11).
	The pause logging icon in the status bar flashes to indicate that the GeoExplorer 3 is not currently storing GPS positions for the selected feature. To start logging, press LOG . For more information, see Pause and Resume Logging, page 22-8.
	The Later option is useful if you want to enter the attributes for a feature, but you are not yet at the feature. For example, if you see a tree feature in the distance, select the Later option and enter the attributes for the tree as you walk towards it. When you reach the tree, press LOG to start logging positions. When you are finished, press CLOSE to store the attributes and positions.

22.1   Entering Attribute Values

(DATA) / **New** / **<Feature>**

When you select a feature from the New feature list, an appropriate attribute entry form appears:

Use the <feature name> form to enter attribute values for the feature.

Press (OPTION) to view the Attribute entry form option list (see page 22-4).

To enter a value for an attribute, select the attribute. The appropriate data entry field appears—Menu entry, Numeric entry (see page 15-44), Text entry (see page 15-37), Date entry, or Time entry. Use this field to enter the value. When you have entered attribute data and collected positions for the feature, press (CLOSE) . The feature is stored and the New feature list reappears. (See Storing Features, page 22-6.)

To discard a feature, press (Fn) + (CLOSE) . You are prompted to confirm that you want to abandon changes. This will discard the feature attributes and positions.

22.1.1 Attribute entry form option list

(DATA) / **New** / **<Feature>** / (OPTION)

Press (OPTION) to display the options available in the attribute entry form.

The options that appear depend on the type of feature selected.

When a point feature is selected, the only option is Offset.

When an area feature is selected, the available options are Offset and New vertex.

When a line feature is selected, Offset, Segment, and New vertex are all available.
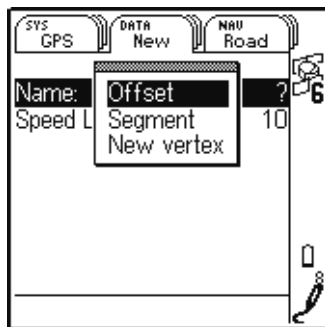
The options are:

- Offset, page 22-5
- Segment, page 22-5
- New vertex, page 22-5

The New Tab

Use this option …	to …
Offset	create an offset for this feature only. Press (OPTION) and select Offset. The Offset form appears. Use this form to enter the offset information. For more information, see Offsets, page 11-8.
Segment	segment a line feature. Press (OPTION) and select Segment. For more information, see Segmenting Line Features, page 11-7.
New vertex	open a vertex within a line or area. While the vertex is open, all positions recorded will be averaged to create a single position on a line. For more information, see Averaged Vertices, page 11-11.

22.2 Storing Features

To save the contents of an attribute entry form and store the positions for the feature, press (CLOSE). A message is displayed briefly in the message box, at the bottom of the New feature list. The message indicates that the feature was stored successfully.

Message box
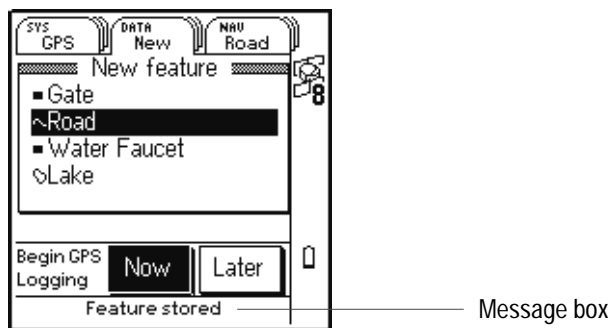
To abandon a feature and return to the New feature list, press (Fn)+ (CLOSE).

You may not want to press (CLOSE) as soon as you have entered attributes for a feature. While the feature is "active" (while you are in the attribute entry form), any GPS positions that are logged are associated with that feature. If recording a point feature, remain stationary at the feature until the minimum number of positions has been logged before pressing (CLOSE). If recording a line or area feature, continue to walk or drive along the feature or around the perimeter until you have traversed the feature completely before pressing (CLOSE).

If you are collecting a feature and you press (CLOSE) before the minimum number of positions has been logged, the GeoExplorer 3 prompts you to confirm whether you want to store the feature.
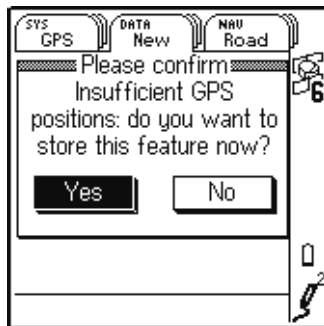
If you select Yes, the GeoExplorer 3 stores the current number of GPS positions. If you select No, the attribute form reappears, and the GeoExplorer 3 continues to record GPS positions for the selected feature.

22.3   Pause and Resume Logging

When the GeoExplorer 3 handheld is logging GPS positions, the logging icon appears in the Status Bar (see page 15-13). Press $\overline{LOG}$ to pause logging. While paused, the GeoExplorer 3 stops logging GPS positions and the pause icon flashes over the logging icon in the status bar.
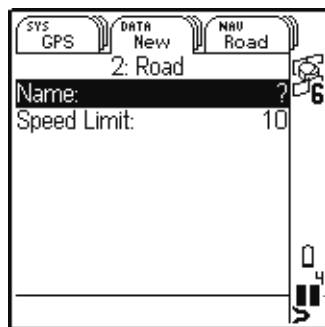
Use the pause function to stop briefly, or if you are collecting a line or area feature and have to travel around some obstacle before picking up the line or area

When GPS logging is paused, the GeoExplorer 3 does not record GPS positions, or velocities. It does continue to record carrier measurements (if the feature is configured for Carrier Phase Data Collection) and certain critical GPS information required for postprocessing.

To resume logging GPS, press $\overline{LOG}$ again. The pause icon stops flashing and the logging icon appears again. Each time you resume logging while collecting a line or area feature, the GeoExplorer 3 data collection system logs a GPS position (regardless of the logging interval that you have set for line/area features).

NOTE   You can only use pause and resume logging when you are logging to a rover data file. You cannot do this when logging GPS data to a base station file.

22.4   New Feature Option List

$\boxed{\text{DATA}}$ / **New** / $\boxed{\text{OPTION}}$

Press $\boxed{\text{OPTION}}$ from New feature list to display the available options.
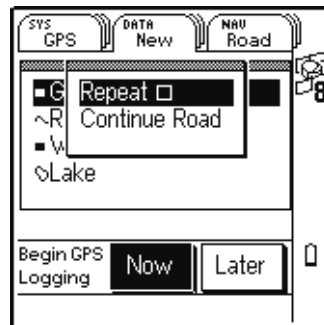
The options are:

- Repeat, page 22-10
- Continue <feature>, page 22-10

The New Tab

Use this option …	to …
Repeat	repeat a feature. Press (OPTION) and select Repeat. A ✓ appears in the check box to the right of the Repeat option. For more information, see Repeating Features, page 11-14.
Continue <feature>	continue a line or area feature. Press (OPTION) and select Continue <feature>. The attribute entry form reappears. **NOTE** While traversing a line or area feature, you can close the feature, collect any number of point features, and then continue the line or area using the Continue option. For more information, see Continuing Line and Area Features, page 11-6.

23 The Update Tab

NOTE   Data update, using transferred .ssf files, is not available with the GeoExplorer 3c Edition (see page 2-5).

(DATA) / **Update**

To display the Update tab, press (DATA) until the Update tab is active.

Message box
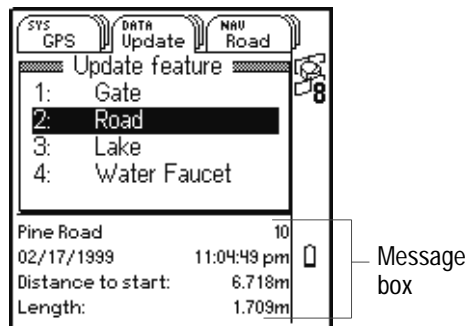
If a data file is not currently open, The File Tab (see page 21-1) appears. When a data file is open, the Update feature list appears. To update a feature, select it from the list. An attribute entry form appears.

While you have an existing feature open for attribute update, you can switch to the New tab, open a new feature, and record attribute and GPS data. For more information, see The New Tab, page 22-1.

Press (OPTION) to view the Update Feature Option List (see page 23-8).

The message box at the bottom of the screen displays:

- Labels, page 23-2
- Distance to point/start, page 23-2
- Date and Time, page 23-2
- Positions / Length / Area, page 23-2

Information	Description
Labels	Two configurable labels showing attribute information for the highlighted feature.
	TIP To select the two attributes that will be displayed, use the Feature Settings, page 19-60 option in the Setup tab.
Date and Time	The date and time when the highlighted feature was collected or last updated.
Distance to point/start	The distance from your current position to the highlighted feature, or the start point of a line or area.
Positions / Length / Area	The number of positions logged for the highlighted **point** feature. The computed 2D length of the highlighted **line** feature. The computed 2D area of the highlighted **area** feature.

23.1   Updating Attribute Values

(DATA) / **Update** / **<Feature>**

When a file is transferred from the GPS Pathfinder Office software a check box appears to the right of each feature.

```
┌─SYS──┐┌─DATA──┐┌─NAV──┐
│ GPS  ││ Update││ Road │
╞══════Update feature══════╡  ⌐
  5:    Water Faucet    □   │6
  6:    Parking lot     □
  7:    Sign            ☑
  8:    Light Source    □
├──────────────────────────┤
 Information
 04/15/1999      04:51:50 pm  ▯
 Distance to point:   2.036m
 Positions:              1
```
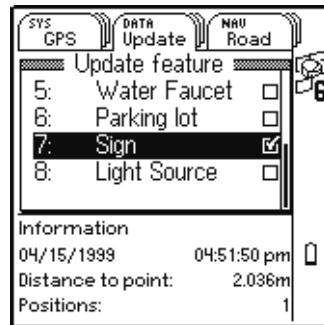
If a check box is empty, the feature is not updated.

If the check box contains a ✓ , the feature is updated.

For more information see Mark, page 23-6.

NOTE   When no features are stored in the file, the Update feature list is empty. A message indicates that there are no features.

NOTE   The ✓ and □ symbols do not appear on the GeoExplorer 3c edition. The GeoExplorer 3c edition does not support transferred .ssf files from the GPS Pathfinder Office software.

To update a feature select it from the Update feature list. An attribute entry form appears:

Use the form to edit the attribute values for the feature.

Press (OPTION) to display the Update Attribute Option List (see page 23-5).

To edit the value for an attribute, select it. The appropriate data entry field appears: Menu entry, Numeric entry (see page 15-44), Text entry (see page 15-37), Date entry, or Time entry.

When you have edited the attribute data, press (CLOSE). The updated information is stored and the Update feature list reappears. A ✓ indicates that the feature has been updated.

To abandon a feature, press (Fn) (CLOSE). You are prompted to confirm this cancellation.

NOTE The ✓ (to indicate that a feature has been updated) only applies to files transferred from the GPS Pathfinder Office software. A ✓ does not appear when you update features collected during a current data collection/update session.

23.1.1 Update Attribute Option List

(DATA) / **Update** / **<Feature>** / (OPTION)

Press (OPTION) from the attribute entry form to display the option list.
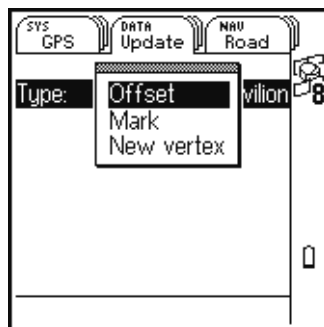
The options are:

- Offset, page 23-6
- Mark, page 23-6
- New vertex, page 23-6

NOTE   The Mark option only appears when the updated file has been transferred from the GPS Pathfinder
Office software.

The Update Tab

Use this option …	to …
Offset	create an offset for the selected feature in the update feature list. For more information, see Offsets, page 11-8.
Mark	place a ✓ in the check box next to the selected feature. When you update the attributes or GPS data for a feature, a ✓ automatically appears in the check box. Use this option to manually insert a ✓ to mark the feature as updated.
New vertex	Open a vertex within a line or area. This option only appears in the Update attribute option list once you have chosen to update GPS data for the feature. While the vertex is open, all positions recorded will be averaged to create a single position on a line. For more information, see Averaged Vertices, page 11-11.

23.2   Updating GPS Data

To update the GPS data for a feature, select it from the list. The attribute entry form appears. Press
(LOG). The GeoExplorer 3 data collection system starts logging GPS positions. Depending on how
the Allow GPS update (see page 19-7) and Warning distance (see page 19-7) fields are configured, the
GeoExplorer 3 prompts you to confirm the GPS update. (Use the Data (see page 19-4) form in the
Setup tab to configure these fields).
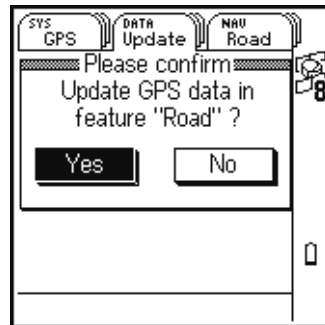
If you select Yes, the GeoExplorer 3 replaces the existing GPS
data and starts logging GPS data now or later depending on the
option selected on the New tab.

If you select No, it does not log new GPS data.

NOTE   You can only update GPS data for one feature at a time, so if a new feature is open in The New Tab,
you cannot update GPS data for an existing feature. However, you can still update its attribute
information (see Updating Attribute Values, page 23-3).

When you have finished collecting positions for a feature, press (CLOSE). The updated information is
stored and the Update feature list reappears. The new GPS positions replace the existing position for
the selected feature and a ✓ appears next to the feature to indicate that it is updated.

23.3 Update Feature Option List

(DATA) / **Update** / (OPTION)

Press (OPTION) from the Update feature list to display the option list.
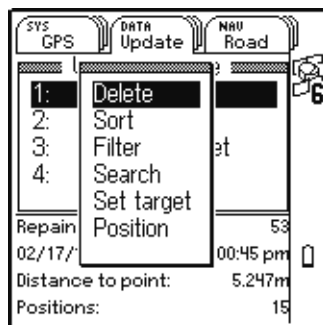
The options are:

- Delete / Undelete, page 23-9

- Search, page 23-17

- Sort, page 23-10

- Set Target / Clear Target, page 23-19

- Filter, page 23-11

- Position / Summary, page 23-20

23.3.1 Delete / Undelete

⬭DATA⬭ / **Update** / ⬭OPTION⬭ / **Delete**

To delete a feature from the Update feature list, highlight it. Press ⬭OPTION⬭ and then select Delete. A line appears through the deleted feature.
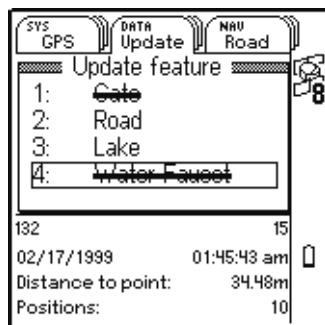
In this example, features 1 and 4 are deleted.

NOTE   Deleted features do not appear on the Map or the Chart.

To restore a deleted feature from the Update feature list, highlight it. Press ⬭OPTION⬭ and select Undelete. The line disappears from the feature name.

You cannot delete a feature if it is the current navigation target. To delete the current target, you must first select a different feature or waypoint as the target, or clear the target status from the current target. For more information, see Set Target / Clear Target, page 23-19.

The GPS Pathfinder Office software transfers deleted features to the office computer where you can undelete them, but it does not export them to the GIS.

23.3.2 Sort

(DATA) / **Update** / (OPTION) / **Sort**

To sort the Update feature list, press (OPTION) and select Sort. The Sort by sublist appears (see Sublists, page 15-33). The options are:

- Feature, page 23-10
- Time, page 23-10
- Distance, page 23-10

Use this option ...	to ...
Feature	sort by feature name.
Time	sort by the time recorded, from first to last.
Distance	sort by distance to start of feature, from closest to furthest away.

A sort is applied at the time you select it. Features added after the list is sorted appear at the end of the list regardless of the sorting order.

NOTE   Each feature in a file has a unique feature number that is assigned when the feature is created. Sorting the Update feature list does not change the number assigned to a feature.

TIP   To display features so that their feature numbers are sequential, sort the Update feature list by time.

23.3.3 Filter

(DATA) / **Update** / (OPTION) / **Filter**

Filtering on the GeoExplorer 3 is a method of selectively viewing features based on a set of criteria set out below.

To filter the Update feature list, press (OPTION) and select Filter. The Filter by sublist appears (see Sublists, page 15-33). The options are:

- None, page 23-12
- Feature, page 23-12
- Attribute, page 23-12
- Time, page 23-12
- Status, page 23-13

When a filter is applied, the filter icon ▼ appears in the title of the Update feature list. This icon also appears beside the filename at the bottom of the Map screen.

Whenever a filter is applied, the features that match the criteria are retained in the Update feature list and in the Map screen. Features that do not match the criteria are hidden.

A filter remains in effect until a file is closed. New features may not appear in the update feature list, depending on how the list is filtered. Only one filter is displayed at a time. Each new filter replaces the previous one.

NOTE   Each feature in a file has a unique feature number that is assigned when the feature is created. Filtering the Update feature list does not change the number assigned to a feature.

Use this option …	to …
None	remove all filters from the Update feature list and the Map tab.
Feature	filter the Update feature list based on feature type. Select the Feature option. A checklist appears (see Checklists, page 15-34). Select the feature type(s) that you want to filter. If you select the Gate feature, for example, the Update feature list is filtered and only Gate features are displayed.
Attribute	filter the Update feature list based on attribute values. Select the Attribute option. The Filter by attribute form appears. You can use this form to set a filter which selects an attribute value from a single feature or across all features.
Time	filter the Update feature list based on the time or date that a feature was started. For example, you can display only those features collected on May 26th, between 9:00 a.m. and 12:00 p.m.
	Select the Time option. A form appears with the four fields: Start time, Start date, End time, and End date. Filter the list using one or more of these fields. To edit a field, select it and use the Numeric entry (see page 15-44) field to enter a value.

Use this option ...	to ...
Status	filter the Update feature list based on the current status of the features. For example, you can use this option to display only those features that are new (collected during the current session).
	Select the Status option. A checklist appears with the options:
	• Deleted • Updated
	• Not deleted
	• New
	• Imported
	Select the status that you want to filter. The Update list is filtered and only features with that status appear.

Filter by attribute form

(DATA) / **Update** / (OPTION) / **Filter / Filter by Attribute**

Select the Attribute option from the Filter by sublist to display the Filter by attribute form:

Select the Any option from the Feature type field to set a filter that compares all attributes in all features to the operator and value you specify in the Operator and Attribute value fields.

Select a feature from the Feature type field to set a filter that only compares attribute values in features of that type.

When you select a feature from the Feature type field, the Attribute field appears. Select the Any option to filter all attributes from this feature type, or select an attribute name to filter only values in that attribute.

The options in the Operator field depend on the selections that you have made in the Feature type and Attribute fields.

If the attribute type is …	the options in the Operator list are …
Any, Text, or File	• None — any attribute value is accepted. • Containing — the attribute value must include the value you specify. For example, if you enter "pot", then the values "potato" and "spot" will be accepted, as well as "pot". • Not containing — no part of the attribute may include the value you specify. **NOTE** The text is not case sensitive. • Greater than — the attribute value must be greater than the text you specify. For text values, "a" is considered the lowest value and "z" is the highest. For example, if you specify "park", then the values "parks", "parrot", and "tree" are accepted, but "parachute" and "cat" are not. • Less than — the attribute value must be less than the text you specify.

The Update Tab

If the attribute type is …	the options in the Operator list are …
Numeric, Date, or Time	• None • Equals — the attribute value must match the value you specify exactly. • Not equal to — the attribute value must not match the value you specify. • Greater than • Less than
Menu	• Equals • Not equal to

23.3.4 Search

(DATA) / **Update** / (OPTION) / **Search**

Searching is a method of locating features in the Update feature list. You can also search from The Map Tab, page 24-1.

To search the Update feature list, press (OPTION) and select Search. The Search form appears.

```
┌─────────────────────────────┐
│ ⌐SYS  ⌐DATA  ⌐NAU           │
│  GPS   Update  Road         │
│        Search          ⌐5   │
│ Direction:      Backwards   │
│ Feature Type:         Any   │
│ Operator:       Containing  │
│ ▌Attribute Value:    Good▐  │
│                             │
│                             │
│                      ▯      │
│                             │
│                             │
└─────────────────────────────┘
```

Set the search criteria by selecting a search direction, feature type, attribute, comparison operator, and a value to search for. Press (CLOSE) to close this form and start the search. The first feature that matches the search criteria is highlighted in the Update feature list.

NOTE   The search starts from the currently highlighted feature, not the start or end of the list.

NOTE   If a filter is applied, only the features that meet the filter criteria are searched.

Press (OPTION) to display the Search option list. This list contains one option, Reset. Select this option to return the fields in the Search form to their default values.

The Search form contains:

- Direction, page 23-18
- Operator, page 23-18
- Feature Type, page 23-18
- Attribute Value, page 23-18
- Attribute, page 23-18

Use this field ...	to ...
Direction	specify the direction of the search. Select Forwards to search from the currently selected feature in the Update feature list or Map tab towards the end of the list. Select Backwards to search from the selected feature towards the start of the list.
Feature Type	select a single feature type to search. Select Any to search all features in the Update feature list.
Attribute	specify an attribute from the selected feature to search. Select Any to search all attributes in the selected feature. If Any is selected in the Feature type field, this field does not appear.
Operator	specify the comparison operation for the search. The operators available are the same as those available for filtering by attribute. For more information, see Filter by attribute form, page 23-14.
Attribute Value	specify the search value.

The Update Tab

23.3.5 Set Target / Clear Target

(DATA) / **Update** / (OPTION) / **Set target**

(DATA) / **Update** / (OPTION) / **Clear target**

To set the currently selected feature in the Update feature list as the navigation target, press (OPTION) and select Set target. The crossed-flag target icon appears beside the selected feature in the list, and is cleared from any previously selected target.

```
┌─────────────────────────┐
│ (SYS  )(DATA  )(NAU  )   │
│  GPS    Update   Road    │
│ ═══ Update feature ═══ ⚐ │
│ 1:   Gate          ⚔  6  │
│ 2:   Road                │
│ 3:   Water Faucet        │
│ 4:   Lake                │
│                          │
│ Repaint            53    │
│ 02/17/1999   11:04:49 pm ▯│
│ Distance to point: 5.684m│
│ Positions:         15    │
└─────────────────────────┘
```
Current navigation target
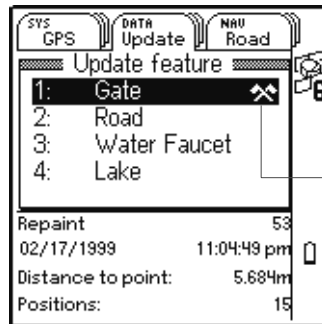
When you set a target in the Update feature list, it is also set in the Map tab and in the NAV section.

NOTE   You cannot select a deleted feature or a feature that has no position information as the target. This option is not available when the selected feature is deleted or has no positions.

To clear the currently selected target, highlight the feature in the Update feature list that is selected as the target, press (OPTION), and select Clear target. The target icon disappears from beside the feature name, and the target is cleared in the DATA and NAV sections.

The Update Tab

23.3.6 Position / Summary

(DATA) / **Update** / (OPTION) / **Position**

(DATA) / **Update** / (OPTION) / **Summary**

To view the GPS position of the feature highlighted in the Update Feature Option List (see page 23-8), press (OPTION) and select Position. The coordinates of the highlighted feature appear in the message box at the bottom of the screen. For point features, the position displayed is the average GPS position. For line and area features, the position displayed is the start point of the feature.

When the Position option is selected, you can change the message box display to show summary information. To do this, press (OPTION) and select Summary.

24 The Map Tab

NOTE   The Map tab is not available with the GeoExplorer 3c Edition (see page 2-5).

(DATA) / **Map**

To display the Map tab, press (DATA) until the Map tab is active. If no data file is open, The File Tab (see page 21-1) appears. If a data file is open, the Map tab appears:
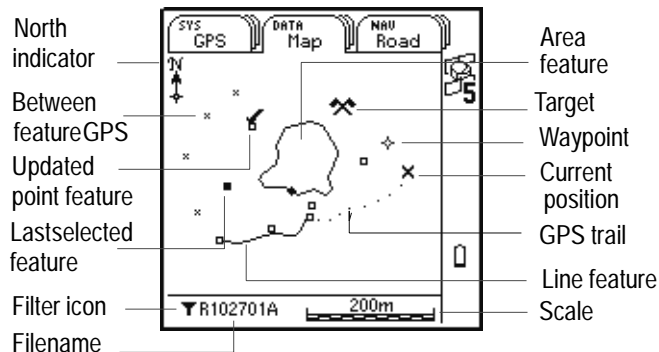
Use this tab to view and select features for update. It is a graphical view of the Update feature list that you access from The Update Tab (see page 23-1).

Press (OPTION) to view the Map Option List (see page 24-6).

The Map screen displays:

- Between feature GPS, page 24-3
- Current position, page 24-3
- Features, page 24-3

- Filename, page 24-3
- Filter icon, page 24-3
- GPS trail, page 24-3

- Last selected feature, page 24-3
- North indicator (N), page 24-3
- Scale, page 24-3

- Target, page 24-3
- Waypoint, page 24-3

NOTE   There are two map screens available on the GeoExplorer 3. Use the Map tab, in the DATA section, to view, select, and update features as well as set them as targets. Use The Chart Tab (see page 28-1), in the NAV section, to navigate to features and waypoints.

The Map Tab

Item	Description
Between feature GPS	Small crosses that show all positions logged between features.
Current position	Your current GPS position.
Features	Point, line, and area features. Each feature type appears as a different symbol on the map. The ✓ on a feature indicates that the feature is updated.
Filename	The name of the data file that is currently open.
Filter icon	An icon that appears when a filter has been applied to the file. Use the Filter option in the Map Option List to set or clear a filter.
GPS trail	A trail of dots that shows the path you have taken.
Last selected feature	The last selected feature on the map remains highlighted.
North indicator (N)	North direction.
Scale	The scale of the screen. As you zoom in/out, the scale changes accordingly.
Target	The feature or waypoint currently set as the target.
Waypoint	A waypoint on the GeoExplorer 3.

24.1   Using the Map Tab

The Map Tab (see page 24-1) is similar to The Update Tab (see page 23-1). You can perform all the same tasks using it as you can using the Update feature list. The Map tab and Update feature list are related. When you select a feature on the map, the same feature is selected in the Update feature list, and vice versa. If you delete a feature on the map, that feature is deleted from the list.

TIP   To move between these two tabs, press ⬭ DATA .

To display the cursor, press an arrow key.
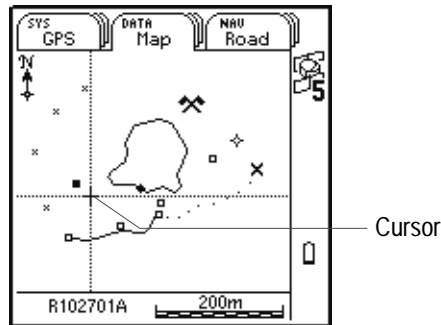
Cursor

If the selected feature is visible, the cursor initially appears over it. If the selected feature is not visible, the cursor appears at the last location on the screen (if that is visible). Otherwise, the cursor appears in the center of the screen.

To move the cursor, press the arrow keys. To move it diagonally, press two arrow keys at the same time.

Use the cursor to select a feature on the map. When the cursor is close to a feature, the symbol for that feature is highlighted, and the feature number, name, and up to two labels showing attribute values from the feature are displayed. The feature is selected.

TIP   To configure the two attributes that are displayed as labels, use the Feature Settings, page 19-60 option in the Setup tab.

As the cursor moves away from a highlighted feature, the feature information disappears. However, the feature remains selected (highlighted) until another feature is selected.
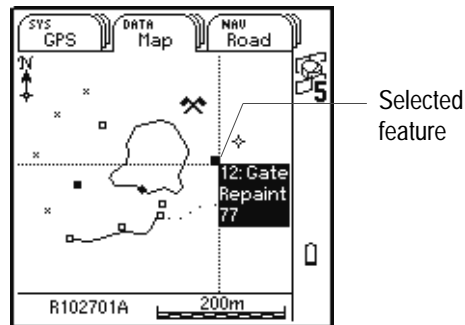
In this example, the Gate feature is currently selected.

Selected feature

When the cursor moves to the edge of the map, the map automatically pans (half a screen width) in the direction of the cursor movement. The cursor remains in the same geographic position. In these circumstances, the current GPS position may not be visible.

Alternatively, press ⒡ⓝ ◁, ⒡ⓝ ▷, ⒡ⓝ △, or ⒡ⓝ ▽ to pan the screen (half a screen width). You cannot pan across the screen unless the cursor is visible.

To remove the cursor, press ⓒⓛⓞⓢⓔ . If the current GPS position is not visible, the screen automatically pans until the current GPS position symbol is in the center of the screen.

24.2 Map Option List

DATA / **Map** / OPTION

Press OPTION to display the available options for the Map.
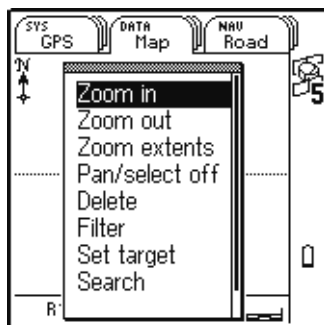
The options are:

- Zoom in, page 24-7
- Zoom out, page 24-7
- Zoom extents, page 24-7
- Pan/select, page 24-7
- Delete, page 24-8
- Filter, page 24-8
- Set target, page 24-8
- Search, page 24-9
- Layers, page 24-9

Use this option …	to …
Zoom in	zoom in to the map screen. Press ⬭OPTION and select Zoom in. This magnifies the display (by decreasing the scale). The scale on the bottom of the screen adjusts accordingly. When the cursor is active, the screen zooms in on the cursor. When the cursor is not active, the screen zooms in on the current GPS position.
Zoom out	zoom out of the map screen. Press ⬭OPTION and select Zoom out. This lets you see a greater area (by increasing the scale). The scale on the bottom of the screen adjusts accordingly. When the cursor is active, the screen zooms out relative to the cursor. When the cursor is not active, the screen zooms out relative to the current GPS position.
Zoom extents	change the scale so that all selected layers are visible on the map screen. The Zoom extents option varies. What it shows depends on what layers are selected and whether the features are filtered. If nothing can be displayed on the screen, the Zoom extents option does not affect the map scale.
Pan/select	activate the on-screen cursor. Use the on-screen cursor to pan the screen in the direction of the cursor movement. You can also use the cursor to select features on-screen.

Use this option ...	to ...
Delete	delete a feature from the map. To do this, highlight it with the cursor, press ⓄⓅⓉⒾⓄⓃ, and select Delete. A line appears through the deleted feature in the Update feature list and the feature is deleted from the map. **NOTE** To restore deleted features use the Update Feature Option List (see page 23-8). **NOTE** A feature or waypoint that is currently set as the target cannot be deleted.
Filter	filter the features that appear on the map screen. Select the Filter option. A sublist appears with the following options: • None – Removes all filters. • Feature – Filters the features based on the feature names. • Attribute – Filters the features based on attribute values. • Time – Filters the features based on the time or date a feature was started, or the time or date it was ended. • Status – Filters the features based on the current status of the features. For more information, see Filter, page 23-11.
Set target	set the feature or waypoint, which is currently selected by the cursor on the map screen, as the navigation target. The crossed-flag target icon appears over the selected feature or waypoint. For more information, see Set Target / Clear Target, page 23-19.

Use this option ...	to ...
Search	search among the features that appear on the map screen. Select the Search option. The Search form appears. Select a search direction, feature type, attribute, comparison operator, and attribute value to search for, then close this form to start the search. The first feature on the map that matches the search criteria is highlighted. If the cursor is active, feature information also appears. For more information, see Search, page 23-17.
Layers	specify the layers displayed on the map screen. Select the Layers option. A checklist appears with the layers: • Feature – Displays the features stored in the current data file. When this is selected, features are displayed on the map screen. • Waypoint – Displays the waypoints stored on the GeoExplorer 3. When this is selected, waypoints are displayed on the map screen. • GPS trail – Displays a trail of dots that shows the path you have taken. When this is selected, a trail of dots is displayed on the map screen. The trail shows up to a maximum of 60 positions. Old positions drop off as new ones are added.

Use this option ...	to ...
Layers (continued)	• Between feature GPS – Displays a trail of small crosses that show all positions logged between features (see Log between features, page 19-5). • Updated – Displays a ✓ on features that are updated. For line and area features the ✓ appears at the start point. For more information, see The Update Tab, page 23-1. **NOTE** By default, all layers are selected except GPS trail.

25 THE NAV SECTION

Use the NAV section to navigate to features and waypoints. Each tab in the NAV section provides you with a different way of navigating. With the Road tab, you navigate using a road screen; with the Compass tab, you use a compass; and with the Chart tab, you use a map to navigate to a feature or waypoint. Choose the navigation method that suits your current situation or personal preference.

Press ⬭NAV⬭ to move between the tabs in the NAV section.

The NAV section has three tabs:

*   The Road Tab, page 26-1
*   The Compass Tab, page 27-1
*   The Chart Tab, page 28-1

NOTE   The Chart tab is not available with the GeoExplorer 3c Edition (see page 2-5).

The NAV Section

26 The Road Tab

(NAV) / **Road**

To display the Road tab, press (NAV) until the Road tab is active. The road navigation screen appears:

Current position

Target name

Info windows
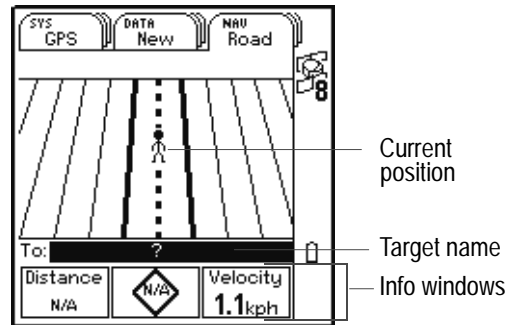
Use this tab to navigate to targets and to display information about your location relative to the location of the target.

Press (OPTION) to view the Road Option List (see page 26-8).

The Road screen contains:

- Current position, page 26-2

- Target name, page 26-2

- Info windows, page 26-2

WARNING   The Road tab displays a straight line bearing to the target. You may not be able to drive directly to a target using this tab as a source of direction.

Item	Description
Current position	The person symbol represents your location relative to the target. The person symbol always heads straight ahead, towards the top of the screen. This is your heading (see Glossary-10).
Target name	The target name is the name of the target you are navigating to. A "?" appears when no target is selected.
Info windows	You can configure the Info windows (at the bottom of the screen) to provide navigational information. The Info window is only displayed if one or more items are selected. For more information about configuring Info windows, see Road Option List, page 26-8.

26.1   Using the Road Tab

Use The Road Tab (see page 26-1) to navigate to targets. To activate navigation, select a target.

To select a target press (ENTER). The Select target screen appears:
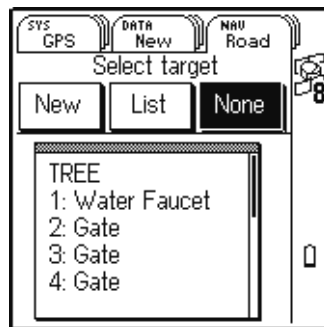
Use this screen to select a feature or a waypoint as your target.

The Select target screen has three buttons:

- New, page 26-19
- List, page 26-19
- None, page 26-19

NOTE   You can also select a target using the Road Option List (see page 26-8), Update Feature Option List (see page 23-8), or Map Option List (see page 24-6).

When you select a target, the Road screen animates to navigate you to it. The graphical display shows where you are and where the target is. The animation of the screen shows what action is required. The Info windows, at the bottom of the screen, display navigational information that you can use to navigate to the target.
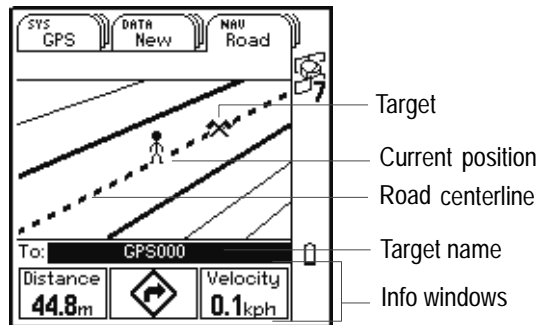
Use the information displayed in this screen to navigate to the selected target.

Target

Current position

Road centerline

Target name

Info windows

The heading, or direction you are going, is always towards the top of the screen.

When you are on course, the road is displayed vertically in the screen. When you are off course, the road is skewed (at an angle) on the screen. The angle (clockwise or counter-clockwise) that the road is turned depends on how far off course you are.

If you are seriously off course, the screen will look similar to this:
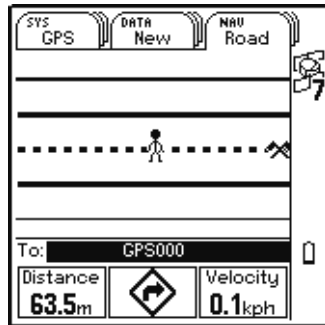
If you are moving in the opposite direction to the target, the person symbol will be ahead of the target symbol.

As you move closer to the target, the road width increases and eventually the target moves away from the edge towards the center of the screen. You know that you have reached the target by using the Distance in the Info windows. This is the distance between you and the target.

In situations where a start waypoint or feature has been specified the road screen will graphically display the cross-track error. When the person symbol moves off the road this means that you have moved away from the line that represents the shortest distance between the start point and the target. The following screen appears:
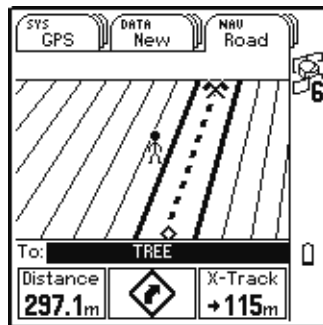
NOTE In this example, the X-Track Info window is shown (the default Info windows are Distance, Road Sign and Velocity).

To set which Info windows are shown, see Info Windows, page 26-9.

When you are within 15 meters of the target, the road screen enters Close-up mode. As you enter Close-up mode, a target icon appears briefly in the status bar and a proximity alarm sounds. In this mode the position of the target symbol on the road indicates its distance from you, and it moves towards the person symbol in the center of the screen as you approach the target. When you have reached the target position, the person symbol is directly over the target symbol.

NOTE Once you enter Close-up mode, the proximity alarm does not sound again unless you move to a position more than 20 meters from the target and then move back within the 15-meter range, or you select a different target.

TIP   You can turn off the proximity alarm, and all other sounds, by setting the beep volume to Off in the SYS section. For more information, see Configurations, page 19-2.

Use this button ...	to ...
New	enter a new target. When you select this button, the New Waypoint (see page 26-15) form appears. Enter the new waypoint information, and press $\boxed{\text{CLOSE}}$. The screen animates and navigates you to the target. For more information, see Using the Road Tab, page 26-3.
List	select a target from a list of waypoints and features on the GeoExplorer 3. Highlight a feature or waypoint, and press $\boxed{\text{CLOSE}}$. The screen animates and navigates you to the target. For more information, see Using the Road Tab, page 26-3. **NOTE** Features available in the list are those stored in the open data file. When no data file is open, no features are available in this list.
None	indicate that no target is selected.

The Road Tab

26.2   Road Option List

(NAV) / **Road** / (OPTION)

Press (OPTION) to view the available options.
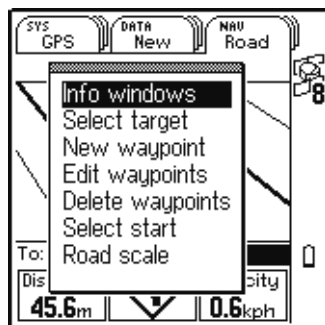
The options are:

- Info Windows, page 26-9
- Select Target, page 26-14
- New Waypoint, page 26-15

- Edit Waypoints, page 26-16
- Delete Waypoints, page 26-17
- Select Start, page 26-18

- Road Scale, page 26-20

26.2.1 Info Windows

NAV / **Road** / OPTION / **Info windows**

To configure the Info windows display at the bottom of a navigation screen, select the Info windows option from the option list (Road, Compass, or Chart). A checklist appears:
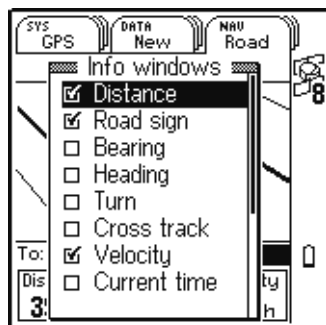
The items are:

- Distance,
  page 26-11

- Road sign,
  page 26-11

- Bearing,
  page 26-11

- Heading,
  page 26-11

- Turn, page 26-11

- Cross track,
  page 26-12

- Velocity,
  page 26-12

- Current time,
  page 26-12

- Arrive in,
  page 26-12

- ETA, page 26-12

- Coordinates,
  page 26-13

- Altitude,
  page 26-13

- Go N/E,
  page 26-13

- Go up,
  page 26-13

When an item is selected there is a ✓ in the check box beside it. To add an item to the display, highlight it, and press (ENTER). A ✓ appears in that check box. To remove an item from the display, highlight it, and press (ENTER). The ✓ disappears.

NOTE   You can display zero, one, two, or three items. To change the items displayed, first remove those currently selected. If you select no items, no information is displayed at the bottom of the navigation screen. If you select Coordinates or Go N/E, you can only display one other item.

NOTE   Not all items in the checklist fit on the screen at one time. Scroll up and down to see them all. Checklists (see page 15-34) scroll in a cyclical fashion.

Checklist item	This item displays …
Distance	the distance remaining between the current GPS position and the target. This is the shortest great-circle distance (see Glossary-10) to the target, computed on your local datum. If no target is selected, the value displayed is N/A.
Road sign	the direction in which you need to turn. If no target is selected, the value displayed is N/A.
Bearing	the bearing (see Glossary-3) to the target. This is the angle that you should follow to take the shortest path between the current GPS position and the target. If no target is selected, the value displayed is N/A.
Heading	the direction in which you are traveling or, if you are stationary, the direction in which you are pointing the GeoExplorer 3 handheld. When you are stationary, GPS cannot give an accurate heading, so the internal digital compass is used. Heading can be displayed whether or not a target or start point is selected.
Turn	the difference between the bearing and the heading. The direction you need to turn to face the target. Adjust your heading (left or right) by the amount shown. If no target is selected, the value displayed is N/A.

The Road Tab

Checklist item	This item displays …
Cross track	the direction and distance of the shortest line between the start point and the target. The direction (left or right) is indicated by "←" or "→". The numeric value indicates the distance you need to travel in that direction to get back on track. When you are on track, you are traveling straight towards the target. When you are off track, the person symbol appears some distance from the centerline. The distance away from the centerline (left or right) indicates how far off track you are. Select a start point and target to display the cross track. When no start point or target is selected, the value displayed is N/A.
Velocity	your current velocity (see Glossary-17). This value takes into account change in altitude as well as horizontal velocity. The velocity can be displayed whether or not a target or start point is selected.
Current time	the current time configured on the GeoExplorer 3 data collection system. Configure the current time using the Formats (see page 19-35) form. The current time can be displayed whether or not a target or start point is selected.
Arrive in	the time remaining until you reach the target. This value takes your current heading into account and shows a larger value if you are not heading directly towards the target. If no target is selected, the value displayed is N/A.
ETA	the expected time of arrival at the target. This is based on the Arrive in time and the Current time. If no target is selected, the value displayed is N/A.

Checklist item	This item displays ...
Coordinates	the current GPS position. The coordinate system that is displayed depends on the configuration. To configure the coordinate system, use the Coordinates (see page 19-25) form. Coordinates can be displayed whether or not a target or start point is selected. When the GeoExplorer 3 is unable to compute GPS positions, the value displayed is N/A.
Altitude	your altitude. If no target is selected, the current altitude value is still displayed.
Go N/E	the direction to the target as a north and east component. If no target is selected, the value displayed is N/A.
Go up	the vertical distance (up or down) to the target. If no target is selected, the value displayed is N/A.

The Road Tab

26.2.2 Select Target

NAV / **Road** / OPTION / **Select target**

To select a target waypoint, choose the Select target option from the option list (Road, Compass, or Chart). The Select target screen appears:
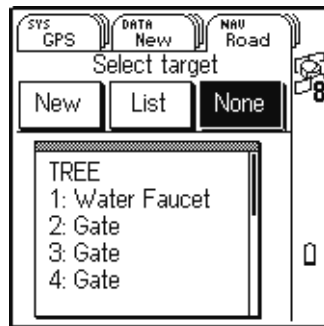
Use this screen to select a feature or a waypoint as your target.

The Select target screen has three buttons:

- New, page 26-19
- List, page 26-19
- None, page 26-19

26.2.3 New Waypoint

(NAV) / **Road** / (OPTION) / **New waypoint**

To create a new waypoint, select the New waypoint option from the option list (Road, Compass, or Chart). The New waypoint form appears:

Use this form to enter new waypoint information. The New waypoint form requires Text entry (see page 15-37) and Numeric entry (see page 15-44).

Press (OPTION) to display the Here option. Use the Here option to automatically update the Lat, Lon, and Altitude fields with the current GPS position.

The GeoExplorer 3 automatically generates a name for the new waypoint. When a new waypoint is created using the current GPS position, the prefix for the name is **GPS** and the suffix is a three-digit number (starting at 000 for the first one created). For example, GPS004. When a new waypoint is created using the cursor, the prefix for the name is **Cursor** and the suffix is a three-digit number (starting at 000 for the first one created). For example, Cursor017.

When you have completed data entry, press (CLOSE) to save the changes. Press (Fn)(CLOSE) to close the form and abandon any changes.

NOTE   The GeoExplorer 3 handheld can store 1,000 waypoints.

26.2.4 Edit Waypoints

(NAV) / **Road** / (OPTION) / **Edit waypoints**

To edit a waypoint, select the Edit waypoints option from the option list (Road, Compass, or Chart). An Edit waypoints list appears:

This list shows all waypoints on the GeoExplorer 3 data collection system. Select the one to be edited. The Edit waypoints form appears.
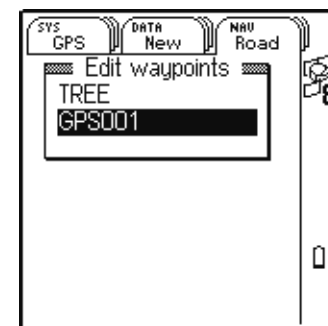
Use this form to edit the waypoint information. The Edit waypoint form requires Text entry (see page 15-37) and Numeric entry (see page 15-44).

Press (OPTION) to display the Here option. Use the Here option to automatically update the Lat, Lon, and Altitude fields with the current GPS position.

When you have completed data entry, press (CLOSE) to save the changes. Press (Fn) (CLOSE) to close the form and abandon any changes.

26.2.5 Delete Waypoints

NAV / **Road** / **OPTION** / **Delete waypoints**

To delete a waypoint, select the Delete waypoints option from the option list. A Delete waypoints list appears:

This list shows all waypoints on the GeoExplorer 3 data collection system. Select the one to be deleted. You are prompted to confirm the deletion.

A waypoint that is set as the start or target cannot be deleted, and cannot be selected from the list.
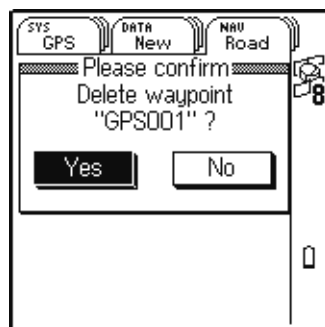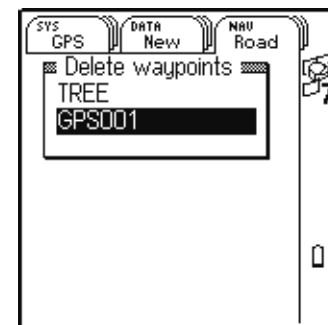
Select Yes to delete the waypoint indicated.

Select No to go back to the Delete waypoints list.

Press **OPTION** to display the Delete all option. Use the Delete all option to delete all waypoints stored on the GeoExplorer 3.

NOTE   The Delete all option does not delete a waypoint if it is set as the start or target.

26.2.6 Select Start

NAV / **Road** / **OPTION** / **Select start**

To select a start point, choose the Select start option from the option list (Road, Compass, or Chart). The Select start screen appears:
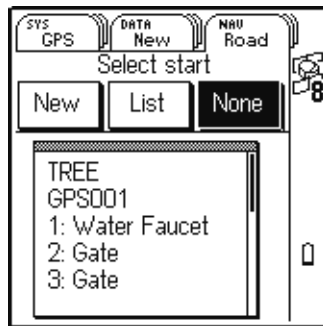
Use this screen to select the waypoint or feature that you want to start navigating from.

The Select start screen has three buttons:

- New, page 26-19
- List, page 26-19
- None, page 26-19

NOTE You do not have to select a start point before navigating to a target. If no start point is specified, some navigational information in the Info windows is displayed as N/A.

NOTE   A start point is displayed in the Road, Chart, and Map tabs as a bold diamond (◈) symbol.

Use this button ...	to ...
New	enter a new waypoint. When you select this button, the New Waypoint (see page 26-15) form appears.
List	select the start point from the list of available waypoints and features on the GeoExplorer 3 handheld. **NOTE** Features available in the list are those stored in the open data file. When no data file is open, no features are available.
None	indicate that there is no start point.

26.2.7 Road Scale

⬭NAV⬭ / **Road** / ⬭OPTION⬭ / **Road scale**

To change the scale of the Road screen that is displayed, choose the Road scale option from the Road option list. Set the road scale according to how accurately you want to follow a path when navigating between a start and a target. For example, if you want to stay close to the path you are traveling, set a small road scale, for example, 10. If staying on track is less important, set a larger road scale, for example, 90.
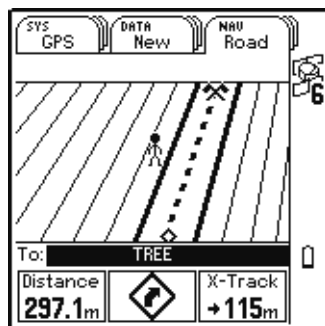
In this example, the road scale is set to 90.
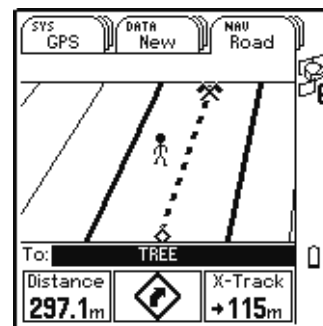
And in this example, the road scale is set to 10.

27 The Compass Tab

(NAV) **/ Compass**

To display the Compass tab, press (NAV) until the Compass tab is active. The Compass tab appears:
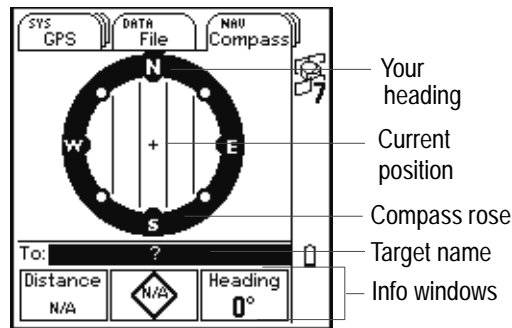
This tab is a combined internal and GPS compass. Use it to orient yourself, and to navigate to a target.

Press (OPTION) to view the Compass Option List (see page 27-7).

NOTE When you receive your GeoExplorer 3 the internal compass may require Calibration (see page 27-8).

The Compass screen contains:

- Your heading, page 27-2
- Current position, page 27-2
- Compass rose, page 27-2
- Target name, page 27-2
- Info windows, page 27-2

Item	Description
Your heading	The top of the compass indicates your direction or heading.
Current position	The + symbol represents your location relative to the target. Your heading is always straight ahead (towards the top of the screen).
Compass rose	The compass rotates to indicate the direction in which you are heading.
Target name	The target name indicates the name of the target you are navigating to. When no target is selected a "?" appears.
Info windows	You can configure the Info windows at the bottom of the screen to provide navigational information. The Info window is only displayed if one or more items are selected. For more information about configuring Info windows, see Info Windows, page 26-9.

The Compass Tab

27.1   Using the Compass Tab

Use The Compass Tab (see page 27-1) to orient yourself and to navigate to targets. The bearings are calculated by an internal compass and GPS information. The GeoExplorer 3 automatically switches between these at a certain velocity (see Glossary-17). This provides an accurate heading at all times, whether you are moving or stationary.

The compass always points towards the configured North reference (see page 19-34).

The type of compass that is displayed indicates which mode of compass the GeoExplorer 3 is using. The GPS compass is the more detailed one.

GPS compass
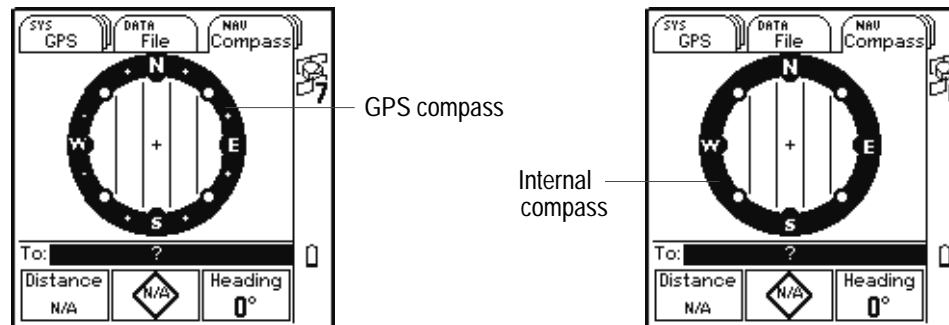
Internal compass

When the internal compass is being used, make sure that the top of the GeoExplorer 3 data is level, to give an accurate reading. The internal compass has an accuracy of 1 in 8; that is, it can display the eight main compass headings. The GPS compass will accurately display all compass headings.

The Compass Tab

To navigate to a target, first select a feature or waypoint. To select a target press (ENTER). The Select target screen appears:
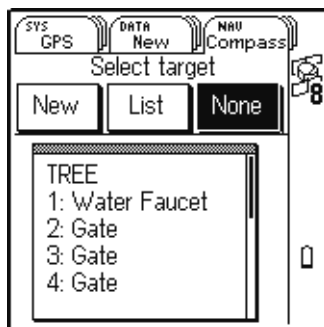
Use this screen to select the target.

The Select target screen has three buttons:

- New, page 26-7
- List, page 26-7
- None, page 26-7

NOTE You can also select a target using the Compass Option List (see page 27-7).

When a target is selected, the target symbol appears on the inside of the compass diagram.
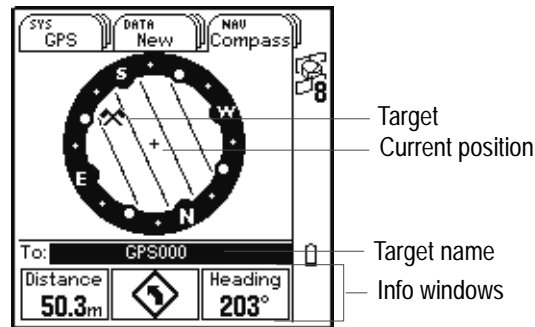
Use this screen to navigate to the target.

The Info Windows (see page 26-9) at the bottom of the screen display information that you can use to navigate to the target.

Target
Current position

Target name
Info windows

The top of the compass shows your heading. The target that you selected appears as a crossed-flag symbol on the inside of the compass diagram. Its position within the compass diagram indicates the bearing to the target. Use your heading and the bearing to the target to navigate to the target. Navigate by lining up the target symbol, which represents the direction to the target (bearing), with the top of the compass, which represents your current direction (heading).

NOTE   The default Info windows are Distance, Road Sign, and Heading. To change this, see Info windows, page 27-2.

When you are within 15 meters of the target, the compass enters Close-up mode. As you enter Close-up mode, a target icon appears briefly in the status bar and a proximity alarm sounds. The current position symbol in the center of the compass changes to **x**. In this mode the position of the target symbol within the compass rose indicates its distance from you, and it moves towards the center of the compass as you approach the target. When you have reached the target position, the center of the compass is directly over the target symbol.

The Compass Tab

NOTE   Once you enter Close-up mode, the proximity alarm does not sound again unless you move to a position more than 20 meters from the target and then move back within the 15-meter range, or you select a different target.

TIP   You can turn off the proximity alarm, and all other sounds, by setting the beep volume to Off in the SYS section. For more information, see Configurations, page 19-2.

Use this button ...	to ...
New	enter a new target. When you select this button, the New Waypoint (see page 26-15) form appears. Enter the new target information, and press (CLOSE). The screen animates and you can use it to navigate to the target.
List	select the target waypoint from the list of available waypoints and features in the GeoExplorer 3. Highlight a waypoint or feature, and press (ENTER). The waypoint or feature becomes the new target. The screen animates and you can navigate to the target.
	NOTE Features available in the list are those stored in the open data file. When no data file is open, no features are available.
None	indicate that there is no target is selected.

27.2   Compass Option List

$\boxed{\text{NAV}}$ / **Compass** / $\boxed{\text{OPTION}}$

Press $\boxed{\text{OPTION}}$ to display the available options for the Compass screen.
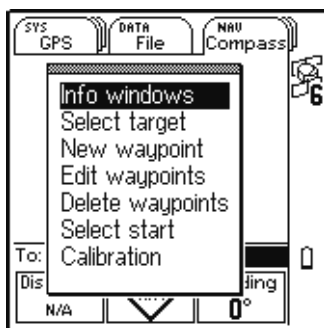
The options are:

- Info Windows, page 26-9
- Select Target, page 26-14
- New Waypoint, page 26-15

- Edit Waypoints, page 26-16
- Delete Waypoints, page 26-17
- Select Start, page 26-18

- Calibration, page 27-8

27.2.1 Calibration

(NAV) / **Compass** / (OPTION)

Local changes in magnetic fields can affect the accuracy of the GeoExplorer 3 compass at low speeds. To take account of local conditions, you must calibrate the internal compass. To do this:

1. Highlight Calibration in the Compass options list and press (ENTER). The following screen appears:

2. Follow the instructions and make sure that the antenna of the GeoExplorer 3 is level. The antenna is located in the top portion of the unit under the Trimble logo.

3. Press (ENTER), and as the countdown takes place, rotate smoothly through a full circle.

    For best results you should finish facing in the direction that you started from. A message will be displayed indicating if calibration is successful.
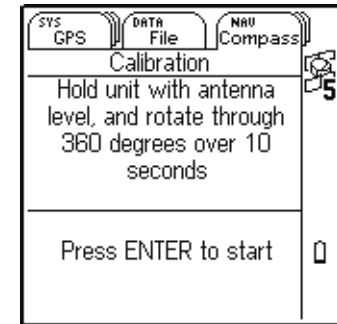
NOTE   The compass always points towards the configured North reference (see page 19-34). Calibrating the internal compass does not change the north reference.

28 The Chart Tab

NOTE   The Chart tab is not available with the GeoExplorer 3c Edition (see page 2-5).

(NAV) / **Chart**

To display the navigation Chart tab, press (NAV) until the Chart tab is active. The Chart screen appears:

North indicator

Start

GPS trail

Target name

Waypoint

Target

Current position

Scale

Info windows
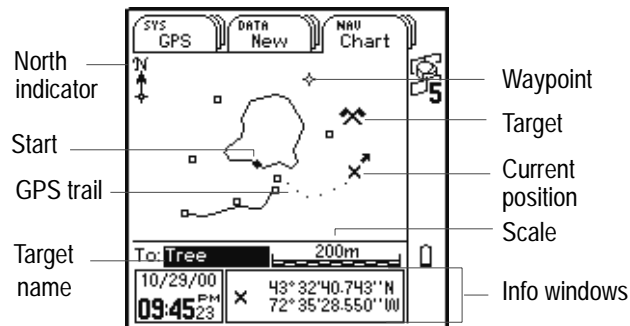
Use this tab to navigate to waypoints and features.

Press (OPTION) to display the Chart Option List (see page 28-8).

The Chart Tab

The Chart screen displays:

- Current position, page 28-3
- GPS trail, page 28-3
- Info windows, page 28-3
- North indicator, page 28-3

- Scale, page 28-3
- Target, page 28-3
- Target name, page 28-3
- Waypoint, page 28-3
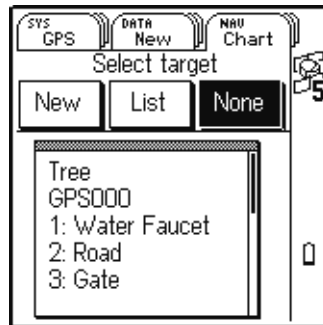
- Start, page 28-3
- Features, page 28-3

NOTE There are two map screens available on the GeoExplorer 3. Use the Map tab, in the DATA section, to view, select, and update features as well as set them as targets. Use the Chart tab, in the NAV section, to navigate to features and waypoints.

Item	Description
Current position	The current position cross indicates your current GPS position. The arrow points in the direction in which you are heading.
Features	Features are the points, lines and areas in the currently open data file.
GPS trail	The GPS trail displays a trail of dots that shows the path you have taken.
Info windows	The Info windows at the bottom of the screen provide navigational information. The default for the Chart tab is Current time and Coordinates. To change the Info windows configuration, use the Chart Option List (see page 28-8). The Info window is only displayed if one or more items are selected.
North indicator	The "N" arrow indicates north.
Scale	The scale indicates the scale of the screen. As you zoom in/out the scale changes accordingly.
Start	The start is the feature or waypoint currently set as the start. When a start and target are configured, a dotted line is drawn between them indicating the shortest path between them.
Target	The target is the feature or waypoint currently set as the target.
Target name	The target name indicates the name of the target you are navigating to. When no target is selected, a "?" appears.
Waypoint	The waypoint symbol represents the position of the waypoints stored on the GeoExplorer 3.

28.1 Using the Chart Tab

Use the Chart tab to navigate to targets (waypoints and features). To activate navigation, select a target. To select a target, press (ENTER). The Select target form appears:

Use this form to select the target that you want to navigate to.

The Select target form has three buttons:

- New, page 26-7
- List, page 26-7
- None, page 26-7

NOTE You can also select a target using the Chart Option List (see page 28-8) or the cursor. For more information, see Using the Cursor, page 28-6.

When you select a target, the chart displays information to help you navigate to it. The chart graphically displays your current position, your heading, the GPS trail positions, the target, the bearing to the target, and all waypoints on the GeoExplorer 3 data collection system. The Info windows at the bottom of the screen can be configured to display relevant information, or removed completely to increase the chart size.
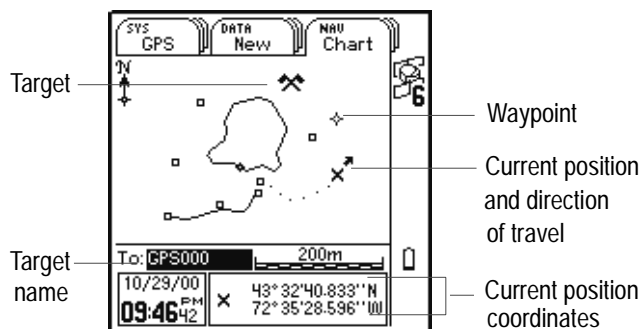
Use the information displayed on the Chart screen to navigate to the selected target.

In this example, you are navigating from the current position (the cross and arrow symbol) to target GPS000 (the cross-flag symbol). The direction in which the current position arrow is pointing indicates your current heading.

When the scale is set so that the target is not visible on the screen, a bearing to the target arrow is displayed from your current position to the target. To navigate to the target, line up your current heading with the bearing to the target. As you get closer to the target, the current position symbol gets closer to the target symbol. You have reached the target when the current position symbol is over the top of the target symbol.

The scale bar at the bottom of the chart screen indicates the scale of the chart. In the example above, the scale of the screen is 200 m. To change this, press (OPTION) and select Zoom in, Zoom out, or Zoom extents.

For more information, see Chart Option List, page 28-8.

The Chart Tab

28.2 Using the Cursor

Use the cursor to select targets and create new waypoints.

To activate the cursor, press an arrow key. The cursor appears:

Cursor

Cursor symbol

Cursor coordinates
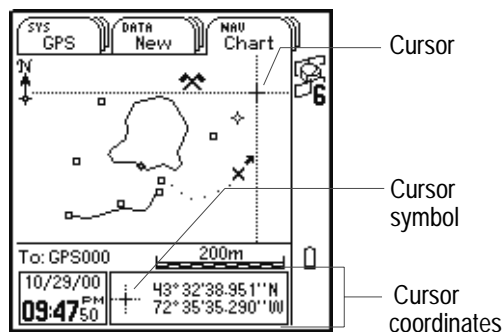
The cursor initially appears over the target. If no target is selected, the cursor appears in the center of the screen.

To move the cursor around the screen, press an arrow key. To move the cursor diagonally, press two arrow keys at the same time. When the cursor moves too close to the edge of the chart, the chart automatically pans in the direction of the cursor movement. The cursor remains in the same geographic position.

When the cursor is visible and coordinates are displayed in the Info windows, these coordinates reflect the current cursor position. The symbol to the left of the coordinates indicates whether the coordinates shown are for your current GPS position (✕) or the current GPS position of the cursor (⊹). In the example above, the symbol shows the current GPS position of the cursor.

NOTE   You cannot pan across the screen if the cursor is not visible.

When the cursor is close to a waypoint or feature (if features are displayed), the symbol for that waypoint is highlighted. In addition, the name of the waypoint is displayed beside it. As you move the cursor away from the waypoint, the name and highlight disappear.

To select a target using the cursor, press an arrow key until the waypoint (or feature) is highlighted and the name appears. Press (ENTER). The Select target form appears with the selected waypoint or feature highlighted in the list. Press (ENTER) to accept the waypoint or feature that is highlighted. It becomes the new target.

To remove the cursor, press (CLOSE).

TIP   To pan the screen, press (Fn) and one of the arrow keys. This will pan the map one screen width in the direction of the arrow key you pressed. The cursor remains in the same position on the screen, not in the same geographic position.

28.2.1 Using the Cursor to Create a New Waypoint

Use the arrow keys to move the cursor to a place on the chart where you want to create a new waypoint. Press (ENTER). The Select target form appears. Select the New button. The New waypoint form appears. Use it to enter information about the new waypoint.

For more information about the Select target form, see Using the Chart Tab, page 28-4.

The Chart Tab

28.3   Chart Option List

(NAV) / **Chart** / (OPTION)

Press (OPTION) to display the Chart options.
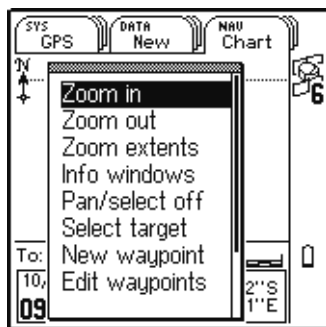
The options are:

- Zoom in,
  page 28-9

- Zoom out,
  page 28-9

- Zoom extents,
  page 28-9

- Info windows,
  page 28-9

- Pan/select,
  page 28-9

- Select target,
  page 28-10

- New waypoint,
  page 28-10

- Edit waypoints,
  page 28-10

- Delete waypoints,
  page 28-10

- Select start,
  page 28-10

- Layers,
  page 28-10

Use this option ...	to ...
Zoom in	zoom in to the chart screen. Press (OPTION) and select Zoom in. This magnifies the display by decreasing the scale. The scale at the bottom of the screen adjusts accordingly. When the cursor is active, the screen zooms in on the cursor. When the cursor is not active, the screen zooms in on the current GPS position.
Zoom out	zoom out of the chart screen. Press (OPTION) and select Zoom out. This lets you see a greater area by increasing the scale. The scale at the bottom of the screen adjusts accordingly. When the cursor is active, the screen zooms out relative to the cursor. When the cursor is not active, the screen zooms out relative to the current GPS position.
Zoom extents	change the scale so that the chart displays all selected layers. The Zoom extents option varies according to the layers selected and whether the features are filtered. If nothing is displayed on the screen, the Zoom extents option does not affect the chart scale.
Info windows	configure the Info Windows (see page 26-9) at the bottom of the screen.
Pan/select	activate the on-screen cursor. Use the on-screen cursor to pan the screen in the direction of the cursor movement. You can also use the cursor to select features and waypoints on-screen.

The Chart Tab

Use this option ...	to ...
Select target	access the Select Target (see page 26-14) screen. Select a waypoint or a feature as the target.
New waypoint	create a New Waypoint (see page 26-15).
Edit waypoints	access the Edit Waypoints (see page 26-16) screen.
Delete waypoints	access the Delete Waypoints (see page 26-17) list.
Select start	access the Select Start (see page 26-18) screen. You can select a waypoint or a feature as the start point.
Layers	specify the layers displayed on the chart. Select the Layers option. A checklist appears with the following layers: • Features – Displays the features stored in the open data file. When this is selected, features are displayed on the chart. • Waypoints – Displays the waypoints stored on the GeoExplorer 3. When this is selected, waypoints are displayed on the chart. • GPS trail – Displays a trail of dots that shows the path you have taken. The trail shows up to a maximum of 60 positions. Old positions drop off as new ones are added. • Between feature GPS – When configured (see Log between features), a trail of small crosses that show all positions logged between features is displayed.

Use this option ...	to ...
Layers (continued)	• Updated – Displays a ✓ on features that are updated. For line and area features the ✓ appears at the start point. For more information, see The Update Tab, page 23-1. NOTE You can only display features in the data file that is currently open. NOTE All layers are selected by default except Updated.

The Chart Tab

29 SPECIFICATIONS

The following tables detail the pinouts for the:

- GeoExplorer 3 Serial Clip, page 29-2
- GeoExplorer 3 Support Module, page 29-3
- Null Modem Cable, page 29-4
- Data/Power Splitter Cable, page 29-5
- RTCM/NMEA Splitter Cable, page 29-6

29.1   GeoExplorer 3 Serial Clip

This table lists the pinouts for the serial clip (part number 38595-00):

DB9 pin #	Clip pin #	Signal	
1		EXT IN	
2	3	TXD1	→
3	2	RXD1	←
4		NC	
5	6	GND	
6		NC	
7	8	RXD2	←
8	7	TXD2	→
9	9	NC	

Specifications

29.2   GeoExplorer 3 Support Module

This table lists the pinouts for the support module (part number 38604-00):

DB9 pin #	Module pin #	Signal	
1		EXT IN	
2	3	TXD1	→
3	2	RXD1	←
4		NC	
5	5	GND	
6		NC	
7	8	RXD2	←
8	7	TXD2	→
9	9	NC	

Specifications

29.3 Null Modem Cable

This table lists the pinouts for the null modem cable (part number 18532):

Pin #	Signal		Pin #	Signal
1	EVENT IN	→	1	CD
2	TXD	←	3	RXD
3	RXD	→	2	TXD
4				
5	GND		5	GND
6	DSR	←	6	DSR
7	PWR ON	→	8	RTS
8	CHG CTRL	→	7	DTR

Specifications

29.4   Data/Power Splitter Cable

This table lists the pinouts for the data/power splitter cable (part number 39183):

Pin #	P1 (DB9 Female)		P2 (DB9 Male)		P3 (Female)
1	GP10		NC		-
2	RXA	→	RXA	→	-
3	TXA	←	TXA	←	-
4	NC		NC		-
5	GND		GND		GND
6	NC		NC		-
7	RTSA/TXB	→	RTSA/TXB	→	-
8	CTSA/RXB	←	CTSA/RXB	←	-
9	EXT PWR		NC		EXT PWR

Specifications

29.5   RTCM/NMEA Splitter Cable

This table lists the pinouts for the RTCM/NMEA splitter cable (part number 39142):

Pin #	P3 (DE9 Female)		Pin #	P1 (DE9 Male)		Pin #	P2 (DE9 Male)	
2	RX1	$\rightarrow$	2	RX1	$\rightarrow$			
3	TX1	$\leftarrow$	3	TX1	$\leftarrow$			
5	GND		5	GND		5	GND	
7	TX2	$\leftarrow$				3	TX2	¨
8	RX2	$\rightarrow$				2	RX2	Æ
9			9					

30 TROUBLESHOOTING

This section lists potential problems and describes how to solve them. It then lists the messages that can appear on the screen of the GeoExplorer 3 handheld. Each list is arranged in alphabetical order.

- Potential Problems, page 30-2
- GeoExplorer 3 Messages, page 30-15

Troubleshooting

30.1 Potential Problems

Listed here are problems that you may encounter when using the GeoExplorer 3 data collector. Select one from the list to view its possible causes and solutions.

- Automatically generated Time attributes are incorrect, page 30-3
- Cannot differentially correct the rover GPS positions when postprocessing, page 30-4
- Coordinates displayed by the GeoExplorer 3 appear to be incorrect, page 30-5
- GeoExplorer 3 is not displaying a GPS position within one minute of being turned on, page 30-6
- GeoExplorer 3 is not tracking satellites within three minutes of being turned on, page 30-7
- GeoExplorer 3 will not turn on, or turns off immediately after being turned on, page 30-8
- The GeoExplorer 3 screen is hard to read, page 30-9
- The internal compass does not appear to be working, page 30-10
- The precision of recorded GPS positions is less than was expected, page 30-11
- The real-time differential correction link is not working, page 30-13
- You are having problems using Beacon-on-a-Belt (BoB) receiver with the GeoExplorer 3, page 30-14

Troubleshooting

30.1.1 Automatically generated Time attributes are incorrect

Possible cause	Fix
The internal clock of the GeoExplorer 3 is set incorrectly.	Reset it by adjusting the Time zone field (in the Formats (see page 19-35) configuration menu). **NOTE** Automatically generated file names are derived from UTC time, not local time.
The GeoExplorer 3 has not received GPS time yet.	Take the GeoExplorer 3 outside and check that it can track at least one satellite. If not, see GeoExplorer 3 is not tracking satellites within three minutes of being turned on, page 30-7.

Troubleshooting

30.1.2 Cannot differentially correct the rover GPS positions when postprocessing

Possible cause	Fix
The rover unit used satellites that were not visible to the base station.	In future make sure that the Elevation mask (see page 19-17) on the rover is set high enough. The rover must only use satellites that are also visible to the Base Station (see page 21-11).
The Base station file started too late or too soon.	Check to see if there are other Base files collected adjacent to your current base file. or Check to see if you can use Base station data from another provider. or In future, make sure the Base file is started before the rover is started, and stopped after the rover file has been closed.

30.1.3 Coordinates displayed by the GeoExplorer 3 appear to be incorrect

Possible cause	Fix
You are using the Latitude/Longitude coordinate system and have selected the wrong datum (see Glossary-5).	Check Coordinates (see page 19-25) and make sure that the correct datum is selected.
You are using the UTM coordinate system and have selected the wrong UTM zone or datum.	Check Coordinates and specify the correct zone and datum. **NOTE** Two datums are commonly used in the USA: NAD-27 (see Glossary-14) and NAD-83 (see Glossary-14).
You have selected the wrong coordinate system, zone, or coordinate units.	Check Coordinates and specify the correct coordinate system, zone, and coordinate units. For more information, see Coordinate Systems, page 13-1.
You have defined a custom coordinate system, datum, and/or zone incorrectly using the Coordinate System Manager in the GPS Pathfinder Office software.	Check the definition of the coordinate system, datum, and/or zone carefully. Make sure that values such as the scale factor are specified correctly (as a parts-per-million value), that rotations are specified in the correct sense (a positive rotation is counter-clockwise), and that Latitudes and Longitudes are specified in the correct hemisphere (North/South or East/West, respectively).

Troubleshooting

30.1.4 GeoExplorer 3 is not displaying a GPS position within one minute of being turned on

Possible cause	Fix
Not enough satellites are available. A minimum of four is required to compute GPS positions.	Ensure you have a clear view of the sky or Use mission planning to check that there are sufficient satellites at this time, and that they are not obstructed from view. or Use the GPS (see page 19-9) slider bar to adjust the configured GPS precision.
The current PDOP value is too high. (The geometry of the satellite constellation is poor)	Use mission planning to check that the current PDOP value is below the configured mask. or Use the GPS slider bar to adjust the configured GPS precision.
There is no real-time link.	Use the Real-time (see page 19-21) form to check if the Mode field is configured for RTCM only. When the GeoExplorer 3 is configured for RTCM only and there is no real-time link, no GPS positions are displayed or recorded.

30.1.5 GeoExplorer 3 is not tracking satellites within three minutes of being turned on

Possible cause	Fix
Satellites are being obstructed.	Identify the obstruction and move away from it. The obstruction may be a building, tree, or vehicle. **NOTE** GPS does not work indoors.
The external antenna (or antenna cable) has not been connected, has been connected incorrectly, or is faulty.	Check The Status Tab (see page 18-1) or Status Bar (see page 15-13) to make sure that the external antenna is connected and working properly. If the GeoExplorer 3 still fails to track signals, the antenna and/or antenna cable may need to be serviced. **NOTE** If the external antenna is not working properly GeoExplorer 3 reverts to the internal antenna.
The almanac is too old. The GeoExplorer 3 has not recorded and stored a current almanac.	Wait (for up to 15 minutes) until the GeoExplorer 3 records an Almanac (see page 17-15).

Troubleshooting

30.1.6 GeoExplorer 3 will not turn on, or turns off immediately after being turned on

Possible cause	Fix
The internal power source is not charged.	Recharge the internal power source or use an external power source.
The GeoExplorer 3 firmware has locked up and is not responding to any keys.	Perform a Warm Boot (see page 15-4) of the system.

30.1.7 The GeoExplorer 3 screen is hard to read

Possible cause	Fix
The screen has been left in direct sunlight.	Remove the handheld from direct sunlight and wait until the screen returns to normal.
The GeoExplorer 3 internal power source is low.	Check the internal power level. Use the The Status Tab (see page 18-1) or the Status Bar (see page 15-13). If the internal power is low, recharge the battery or use an external power source with the GeoExplorer 3 handheld.
The screen display contrast needs adjusting.	Adjust the Screen Contrast (see page 15-3).
The screen backlight needs adjusting.	Adjust the Backlight (see page 15-3) brightness.

Troubleshooting

30.1.8 The internal compass does not appear to be working

Possible cause	Fix
The compass has not been calibrated, or needs to be re-calibrated.	Use the Calibration (see page 27-8) option from the Compass Option List (see page 27-7) to calibrate the compass.
The GeoExplorer 3 is not being held in a level position.	The GeoExplorer 3 needs to be held with the antenna level for the compass to display accurate readings. The antenna is under the Trimble logo.

30.1.9 The precision of recorded GPS positions is less than was expected

Possible cause	Fix
You did not record sufficient positions to achieve the required precision (for a point feature).	Use Feature Settings (see page 19-60) to increase the minimum number of positions required (for a point feature).
You are operating in an area of high multipath (see Glossary-13) interference.	Move away from obstructions, such as buildings and trees, and use Offsets (see page 11-8) to record features. Use an external antenna if available. or Log velocities (see page 19-6) records for use with postprocessing (using the GPS Pathfinder Office Differential Correction utility). or If operating in real-time, use the Velocity filter, page 19-23 option to reduce the effects of multipath.
The GPS slider bar is set too low.	Adjust the GPS (see page 19-9) slider bar.
The PDOP mask is too high.	Lower the PDOP mask (see page 19-15) or move the GPS slider to the right.

Troubleshooting

Possible cause	Fix
The SNR mask and/or Elevation mask is too low.	Increase the SNR mask (see page 19-16) and/or Elevation mask (see page 19-17) or move the GPS slider to the right.
The GeoExplorer 3 is configured to use a minimum of three satellites and the 2D altitude specified is not accurate.	Change the 2D altitude (see page 19-20). **NOTE** Where possible, specify a minimum of four satellites to compute a 3D position. Small inaccuracies in the 2D altitude can lead to much greater horizontal inaccuracy.

Troubleshooting

30.1.10The real-time differential correction link is not working

Possible cause	Fix
The RTCM connection is not connected, has been connected incorrectly, or is faulty.	Use The Status Tab (see page 18-1) or the Status Bar (see page 15-13) to check if real-time corrections are being received. Make sure that you are using the appropriate cable for the radio and that the cable is connected properly. If in doubt, check the serial clip pinouts (see GeoExplorer 3 Serial Clip, page 29-2).
The RTCM communication parameters are configured incorrectly.	Use the COMMS (see page 19-39) form to change the RTCM input and output settings. Consult the documentation for your radio for the correct parameters.
The Station ID is incorrect.	Change the Station ID (see page 19-24) setting.
The GeoExplorer 3 is not receiving corrections from the BoB receiver via the cable-free link.	In the COMMS form make sure the RTCM input field is set to Cable-free BoB. Also, check that the BoB receiver has been enabled for cable-free transmission. For more information, refer to the Beacon-on-a-Belt (BoB) Receiver Manual.
NMEA output is set to the same device as RTCM input.	When the RTCM/NMEA splitter is not being used in the COMMS (see page 19-39) form, turn NMEA output off.

Troubleshooting

30.1.11 You are having problems using Beacon-on-a-Belt (BoB) receiver with the GeoExplorer 3

Possible cause	Fix
The BoB receiver is set to the wrong frequency.	Use the BoB receiver to change the frequency being used to receive real-time corrections.
The BoB receiver is too far away when operating using the cable-free link.	Move the GeoExplorer 3 closer to the BoB receiver.

NOTE There may be other reasons why you are having problems using the BoB receiver with the GeoExplorer 3.

For more information, refer to the troubleshooting section in the Beacon-on-a-Belt (BoB) Receiver Manual.

30.2   GeoExplorer 3 Messages

This section lists the GeoExplorer 3 error, confirmation, and information messages that may be displayed, and their causes. Where relevant, suggestions are given to help you avoid seeing these messages in the future.

- Error!, page 30-16
- Please Confirm..., page 30-23
- Other Messages, page 30-29

Troubleshooting

30.2.1 Error!

`Cannot change mode with custom settings`

While in the Custom mode of the GPS slider bar, you tried to change the mode. You cannot view the Standard mode of the GPS (see page 19-9) slider bar if you are in Custom mode. To change mode, use the arrow keys to highlight the slider bar. Then press ⏺OPTION and select Standard.

`Cannot exceed 1000 waypoints`

You attempted to create a waypoint when the limit of 1000 waypoints stored on the GeoExplorer 3 had been reached. You can delete unnecessary waypoints using the option list in the The Road Tab (see page 26-1), The Compass Tab (see page 27-1), or The Chart Tab (see page 28-1). If you want to save any waypoints first, you can transfer them to your office computer.

`Compass calibration cannot proceed if a data file is open or`
`data transfer is occurring`

You are attempting to calibrate the internal compass while a data file is open or data transfer is occurring. Close any open data files and wait until data transfer is completed, then attempt the calibration.

`<Dictionary file name> is in use and cannot be deleted`

A data dictionary cannot be deleted if it is used by a data file on the GeoExplorer 3. Delete the data file before deleting the dictionary.

`Data dictionary currently in use`

You have tried to open a file using a data dictionary that is currently open for edit in The Setup Tab (see page 19-1). To open a file using this dictionary you must first complete any changes, then close the dictionary, before opening your file.

`Data dictionary too large to edit`

You have tried to open a data dictionary that requires more memory than is available on the GeoExplorer 3. To edit the data dictionary use the Data Dictionary Editor utility in the GPS Pathfinder Office software. For more information on using the Data Dictionary Editor utility, refer to the GPS Pathfinder Office Help.

`Duplicate file names are not allowed`

You have attempted to give a file the same name as an existing file. All file names and identifiers on the GeoExplorer 3 must have a unique name. Case (upper or lower) is *not* significant when comparing two names.

Troubleshooting

`<field>: out of range "min" to "max"`

The number entered is too large or too small. Enter a number within the specified range.

`<field/attribute name>: Entry required`

You are editing a field or attribute that requires a value, but you have not entered one.

`Failed to load configuration file`

The transfer of a configuration file to the office computer was unsuccessful. Make sure that the configuration file is valid and it contains no errors, and that there is enough memory on GeoExplorer 3.

`Failed to load coordinate system`

The transfer of a coordinate system file from the office computer was unsuccessful. Make sure that the coordinate system file is valid and contains no errors, and that there is enough memory on the GeoExplorer 3.

Troubleshooting

`File in use by data transfer`

You have attempted to open or delete a file that is currently being transferred to your office computer or is being overwritten by an transfer from your office computer. Either cancel the data transfer from your office computer or wait until transfer is complete before opening/deleting the data file.

`Inappropriate location for map projection`

You have entered a coordinate (North/East) that is outside the bounds of the configured coordinate system zone. Use Coordinates (see page 19-25) to check that you have selected the appropriate coordinate system and zone. Make sure that you have entered the coordinate correctly (pay particular attention to the hemisphere—N, S, E, or W). If using a custom coordinate system and/or zone, make sure that you defined the coordinate system, datum (see Glossary-5), and/or zone correctly.

`Invalid date`

The date entered is invalid. Make sure that you entered the date in the correct format as configured in Formats (see page 19-35).

`Invalid time`

The time entered is invalid. Make sure that you entered the time in the correct format as configured in Formats (see page 19-35). You can enter time in either the 12 or 24 hour format. If using the 12 hour clock, remember to specify pm if the time is after midday.

Troubleshooting

`Memory nearly full`

This warning message appears if you try to create or open a file when less than 10 KB of data storage space remains. Use The Status Tab (see page 18-1) to see how much memory is left. To create memory space, use The File Tab (see page 21-1) to delete data files.

`<number>: Floating point number too large`

The numeric value entered in a field is too large to be stored or displayed on the GeoExplorer 3.

The GeoExplorer 3 can store and display large numeric values. If this message appears, you have probably entered a wrong value or coordinate in the wrong coordinate system.

`Please charge the internal battery before upgrading`

You are attempting to upgrade the firmware while the unit has a low power supply. To proceed with the upgrade, place the unit in the support module with the power connected. The upgrade can take place when the power level has reached 10%.

`Start time is later than end time`

This message appears when the GeoExplorer 3 is filtering features based on logging time, and the specified End time is not later than the Start time. Enter correct Start and End times.

`Too many info windows selected`

You have selected more Info window options than can be displayed. Typically, three windows can be displayed at once. However, if Coordinates or Go N/E are selected you can only display one other Info window. Reduce the number of Info windows selected before closing the list.

`Unable to append to a file over one week old`

You attempted to log data to a file created more than one week ago. Create a new data file to collect data.

`Unable to go to standby mode if a data file is open`

You have attempted to place the unit in Standby mode while a data file is open. Before entering Standby mode all data files must first be closed. Use the ⬭CLOSE key in the DATA section to close any open features and then the file itself. Once the file is closed, press ⬭ to place the GeoExplorer 3 in Standby mode.

Troubleshooting

`Warning! Position is out of the current coordinate system boundaries`

You attempted to enter or display a geographic position outside the boundaries of the current coordinate system. Use Coordinates (see page 19-25) to see if you selected the appropriate coordinate system and zone. Make sure that you entered the coordinate correctly. Pay particular attention to the hemisphere—N, S, E, or W. If using a custom coordinate system and/or zone, make sure that you have defined the coordinate system, datum, and/or zone correctly.

This message is most likely to appear when you use a coordinate system transferred from the GPS Pathfinder Office software, as the default Lat/Long and UTM coordinate systems have a global scope. For more information, refer to the GPS Pathfinder Office Help.

`You have entered an incorrect password. Operation not allowed.`

The field you have tried to change has been password locked by the office software. The password you have entered is incorrect. If you have forgotten the password, check the password settings for your Configuration file in the Configuration Manager utility.

`Zoom limit reached`

You have reached the maximum or minimum zoom magnification that can be displayed by the map or chart.

30.2.2 Please Confirm...

```
Abandon changes?
```

Select Yes to discard any changes made to the open attribute or form. Select No to cancel the operation and return to the form without losing your changes.

```
Abandon vertex?
```

Select Yes to abandon the positions logged for the current vertex but retain any other logged information. Select No to resume logging the averaged vertex position.

```
Close rover file?
```

Select Yes to close and save the rover file you currently have open. Select No to cancel the close operation and leave the rover file open.

```
Close file and reset to factory defaults?
```

Select Yes to reset the GeoExplorer 3 data collection system to factory default values. Select No to cancel the operation.

The GeoExplorer 3 cannot be reset to factory defaults if a data file (base or rover) is open. If you select Yes, the GeoExplorer 3 will close the file first and then reset the values.

Troubleshooting

`Delete all?`

Select Yes to delete all waypoints that are stored on the GeoExplorer 3. Select No to cancel the operation.

NOTE   If a waypoint is set as the start or target, it is not deleted.

`Delete all files?`

Select Yes to delete all data files (rover and base) that are stored on the GeoExplorer 3. Select No to cancel the operation.

`Delete attribute <attribute name>?`

Select Yes to delete the selected attribute. Select No to cancel the operation.

`Delete base file <filename>?`

Select Yes to delete the selected base file. Select No to cancel the operation.

`Delete dictionary <dictionary filename>?`

Select Yes to delete the selected data dictionary. Select No to cancel the operation.

`Delete feature <feature name>?`

Select Yes to delete the selected feature. Select No to cancel the operation.

`Delete geoid?`

Select Yes to delete the specified geoid. Select No to cancel the operation.

`Delete rover file <filename>?`

Select Yes to delete the selected Rover file. Select No to cancel the operation.

`Delete value <value name>?`

Select Yes to delete the selected value. Select No to cancel the operation.

`Delete waypoint <waypoint name>?`

Select Yes to delete the selected waypoint. Select No to cancel the operation.

Troubleshooting

```
Distance to feature exceeds warning distance: Replace GPS data
anyway?
```

You are updating the GPS position of a feature and your current position is further from the feature's previously recorded position than the configured Warning distance (see page 19-7). Select Yes to overwrite the previous position with the current GPS position. Select No to cancel the operation.

```
Enter upgrade mode? (Firmware upgrade will delete all data
files)
```

Select Yes to enter Upgrade mode. The GeoExplorer 3 must be in Upgrade mode for installation of different firmware versions using the WinFlash software. Installing new firmware will delete all files on the GeoExplorer 3. Select No to abandon the firmware upgrade and return to
The Setup Tab (see page 19-1).

```
File <filename> has not been transferred to the PC: Delete
anyway?
```

The selected data file has not been transferred to the office computer. If you delete it from the GeoExplorer 3, it will not be recoverable. Select Yes to delete the selected file. Select No to cancel the operation.

`Insufficient carrier: Close anyway?`

You have attempted to close a data file that is logging carrier phase data, and the amount of data required (10 minutes) has not been collected. Select Yes to close the file. Select No to continue collecting carrier-phase data.

`Insufficient GPS positions: Do you want to store this feature`
`now?`

You have attempted to close the current point feature before the GeoExplorer 3 could record the configured Minimum positions (see page 19-63). Select Yes to store the point feature anyway. Select No to continue collecting positions for the selected feature.

`Insufficient GPS positions: Do you want to store this vertex`
`now?`

You have attempted to close the current vertex before the GeoExplorer 3 could record the configured Minimum positions (see page 19-63). Select Yes to store the vertex anyway. Select No to continue collecting positions for the vertex.

Troubleshooting

```
No GPS positions recorded: Do you want to abandon this vertex
now?
```

You have attempted to close the current vertex before the GeoExplorer 3 could record any GPS
positions. Select Yes to abandon the vertex. Select No to keep the vertex open to record GPS positions.

```
Reset coordinate systems?
```

Select Yes to remove all coordinates loaded on GeoExplorer 3, except Latitude/Longitude and UTM.
Select No to cancel the operation.

```
Stop base station?
```

Select Yes to stop logging base station data and close the base file. Select No to continue logging data.

```
Update GPS data in feature <feature name>?
```

Select Yes to replace the previous GPS position with the current GPS position. Select No to cancel the
operation.

30.2.3 Other Messages

`Calibration failed, Try again?`

Select Yes to attempt calibration again. Select No to return to the compass screen without calibrating the compass.

`Calibrate digital compass`

The internal compass requires calibration to return an accurate heading under local conditions. To calibrate the compass, select Calibration from the Compass options list. The internal compass affects the use of the Skyplot, Road, Chart, and Compass screens at low velocities. For more information, see Using the Compass Tab, page 27-3.

`Calibration successful`

You have successfully calibrated the compass. Press (ENTER) to close the message. For more information, see Using the Compass Tab, page 27-3.

(Fn) + (OPTION) `to display the main menu`

For an overview of the GeoExplorer 3 system, access the main menu using this combination of keys.

Troubleshooting

```
No match found!
```

The software cannot find a feature that matches the search parameters you specified.

```
Not found
```

No features matching the search criteria have been found.

```
OLD position
```

This message flashes over the GPS position if no current GPS position is available. (This occurs, for example, if there are too few satellites or the geometry is poor.)

```
Please wait... Filtering
```

The GeoExplorer 3 is filtering the features according to the specified parameters.

```
Please wait... Processing
```

The GeoExplorer 3 has a large amount of processing to do and further operation is suspended until the current task is completed. Pressing ⟨Fn⟩ ⟨CLOSE⟩ cancels the current task.

Troubleshooting

`Please wait... Rebuilding file`

The GeoExplorer 3 is checking and repairing files that were not closed properly because of a sudden power failure or similar event.

`Please wait... Searching`

The GeoExplorer 3 is searching the features according to the specified parameters.

`Please wait... Sorting`

GeoExplorer 3 is sorting the features according to the specified parameters.

`Poor geometry`

The current satellite geometry does not meet the precision configured on the GPS (see page 19-9) slider bar.
The current PDOP (see page 17-13) is higher than the configured PDOP mask (see page 19-15).

`Remain stationary`

Remain stationary while you are logging an averaged vertex position.

Troubleshooting

`Some files have not been transferred to the PC: Continue?`

Select Yes to continue with the firmware upgrade. All data files on the GeoExplorer 3 will be permanently deleted. Select No if you want to abandon the firmware upgrade. You may transfer the necessary files and then upgrade your firmware.

`Too few satellites`

The number of satellites being tracked does not meet the precision configured on the GPS (see page 19-9) slider bar.

There are too few satellites with an SNR (see page 17-11) value that is higher than the configured SNR mask (see page 19-16).

`Undefined GPS error`

The GeoExplorer 3 is not tracking satellites for an unknown reason. If this message persists please contact your Trimble dealer to have the GPS equipment serviced.

`Upgrading firmware from WinFlash (Hold down power key to abort)`

The GeoExplorer 3 is now able to communicate with Winflash. If you have not done so already, connect the GeoExplorer 3 to your office computer and run WinFlash to upgrade the firmware to a different version. If you want to abandon the upgrade hold down the power key ⬭ for approximately 10 seconds. Restart using the power key ⬭.

`Validating`

The GeoExplorer 3 is validating the attribute values that you have entered for the current feature. This message also appears if you change fields in a configuration form and then press (CLOSE).

`Vertex open`

You are currently logging an averaged vertex.

`Vertex stored`

This message confirms that you have now saved the averaged vertex you collected.

Troubleshooting

31 INSTALLING THE FIRMWARE

You do not need to install the firmware if you received the **complete** GeoExplorer 3 or GeoExplorer 3c data collection system. This section is only for users who want to:

- change the GeoExplorer 3c firmware option to the GeoExplorer 3 firmware option, or vice versa
- upgrade the GeoExplorer 3 or GeoExplorer 3c firmware to a new version
- install or reinstall the GeoExplorer 3 or GeoExplorer 3c firmware

The following instructions cover:

Installing the Firmware

31.1 Equipment Required for Installation

Before installing the GeoExplorer 3 firmware onto your GeoExplorer 3 data collector, a program called WinFlash must be installed on your office computer. WinFlash is an installation program. The WinFlash software is available, along with the GeoExplorer 3 firmware, from the Trimble web site (www.trimble.com). If you do not have access to the World Wide Web, contact your local Trimble dealer to receive the GeoExplorer 3 installation disks.

To use the WinFlash software with the GeoExplorer 3 data collector you need the following equipment:

- an IBM-compatible personal computer running Windows 95, Windows 98, Windows 2000, Windows ME, or Windows NT, with at least one available serial RS232 port and at least 10 MB of free hard disk space.

- your GeoExplorer 3 data collector

- a 9-pin to 25-pin converter (this is only required if your computer has a 25-pin serial port connector on its COM1 or COM2 ports)

- Null Modem Cable, page 3-19

- a Trimble GeoExplorer 3 Support Module, page 3-11 to provide an external source of power for the installation process, rather than using the internal battery of the GeoExplorer 3. Alternatively, you can upgrade the firmware using the GeoExplorer 3 Serial Clip, page 3-18, but you should make sure that the internal battery is at least 50% charged.

- CD-ROM drive (if you do not have access to the World Wide Web)

Installing the Firmware

CAUTION   It is crucial that you have all of the equipment listed above ***before*** you start to perform the option upgrade or to install the firmware. ***Do not*** attempt to substitute other equipment. By using the recommended equipment and following the instructions provided in this section, you will be able to quickly and reliably perform the process. If you use inappropriate equipment, or fail to follow the instructions, it is likely that you will be unable to install the firmware or upgrade the options successfully. In addition, the risk of erasing the current firmware in your GeoExplorer 3 without replacing it, is greatly increased. If this occurs, you may need to return your GeoExplorer 3 to Trimble for servicing.

Although the GeoExplorer 3 firmware installation and option upgrade can be accomplished by using power from the internal lithium battery of the GeoExplorer 3, it is recommended that you use the Trimble GeoExplorer 3 support module as an external source of power. This prevents accidental termination of the installation process while running off a discharged battery.

CAUTION   Before you start the installation process, make sure that you have transferred any data files and waypoints to your office computer. If you do not, these files will be deleted.

Installing the Firmware

31.2 Upgrading the GeoExplorer 3c to GeoExplorer 3 Firmware

Follow the instructions below to perform either of the following:

- an Option Upgrade with an External Power Source, page 31-5 (using the GeoExplorer 3 support module)
- an Option Upgrade with the Internal Power Source, page 31-7 (using the GeoExplorer 3 lithium battery)

31.2.1 Option Upgrade with an External Power Source

To perform an option install using the GeoExplorer 3 support module as an external power source:

1.   Connect the equipment listed in Equipment Required for Installation (see page 31-2):
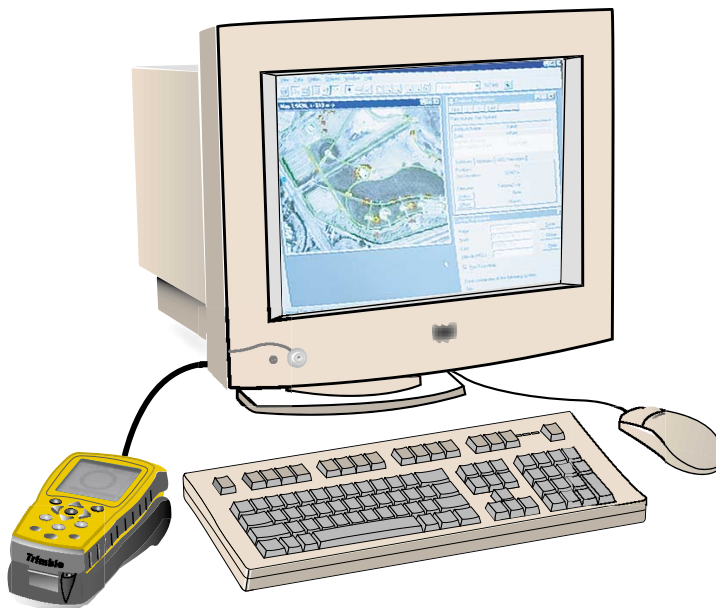
2.   Plug the GeoExplorer 3 support module into the wall current (mains).
3.   Connect the GeoExplorer 3 support module to the COM1 or COM2 serial port of your computer using the supplied null modem cable (part number 18532).

4.   Place your GeoExplorer 3 data collector into the GeoExplorer 3 support module.

5.   Turn on the GeoExplorer 3 and office computer if they are not already on. Check the Status screen on the GeoExplorer 3 to make sure the unit is being powered externally:

You are now ready to option upgrade the firmware. See Proceeding with the Option Upgrade, page 31-9.
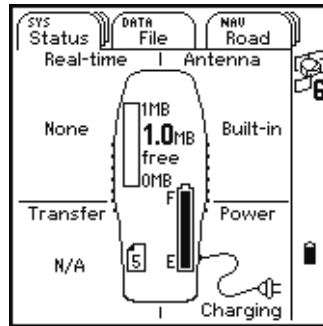
Installing the Firmware

31.2.2 Option Upgrade with the Internal Power Source

To perform an option install using the GeoExplorer 3 internal lithium battery as the power source:

1. Connect the serial clip (part number 38595-00) to swipes on the rear of the GeoExplorer 3 data collector.
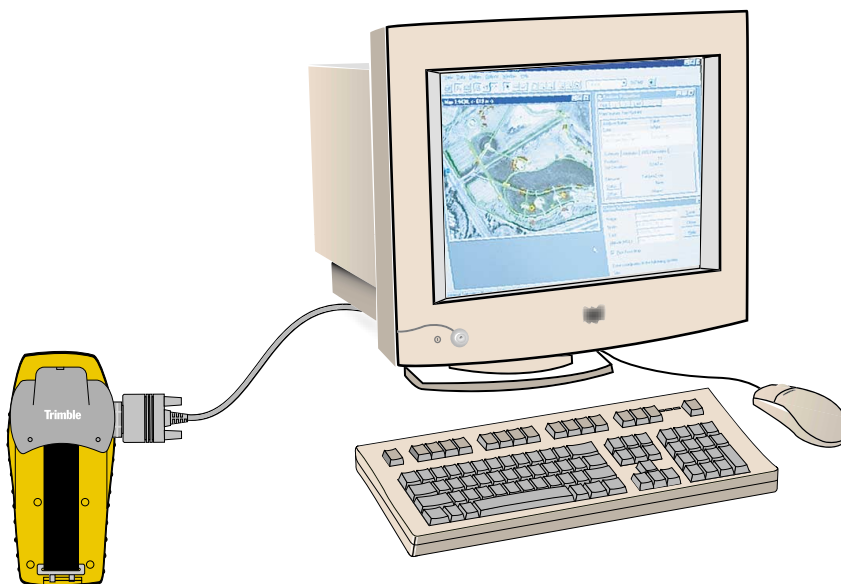
2. Connect one end of the null modem cable (part number 18532) to the serial clip. Connect the other end of the null modem cable to the COM1 or COM2 serial port of your computer.

3.   Turn on the GeoExplorer 3 and office computer if they are not already on. Check the Status screen on the GeoExplorer 3 to make sure the unit is being powered internally:
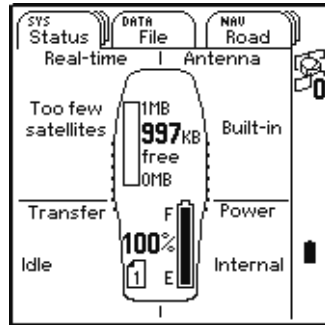
You are now ready to option upgrade the firmware. See Proceeding with the Option Upgrade, page 31-9.

31.2.3 Proceeding with the Option Upgrade

To proceed with the option upgrade:

1. On the GeoExplorer 3, go to the Setup tab in the SYS section and select **Reset**. The following menu appears:
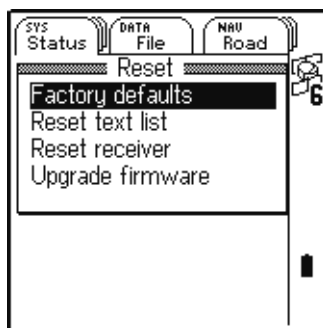
2.   Select Upgrade firmware. You will be asked to confirm this action. You can begin the option upgrade when the following screen appears:
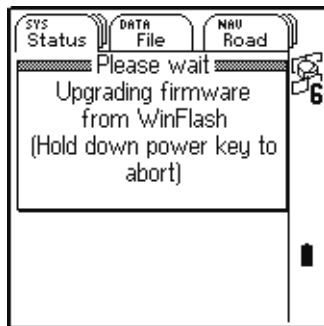
3.   On your office computer, start the WinFlash software. To do this, from the Windows Start menu select Programs / WinFlash / WinFlash.

NOTE   For the firmware upgrade to proceed, the WinFlash program, which is used to install the GeoExplorer 3 firmware onto your GeoExplorer 3 data collector, must be installed on your office computer, along with the GeoExplorer 3 firmware you want to install. The WinFlash program and GeoExplorer 3 firmware can be downloaded from www.trimble.com, or installed from the installation CD.

Installing the Firmware

A dialog similar to the following appears:

4.   Select GeoExplorer 3 Data Collector as the device type.
5.   Specify the serial (COM) port that your GeoExplorer 3 is connected to.

6.   Click **Next**. The Operation Selection dialog appears:
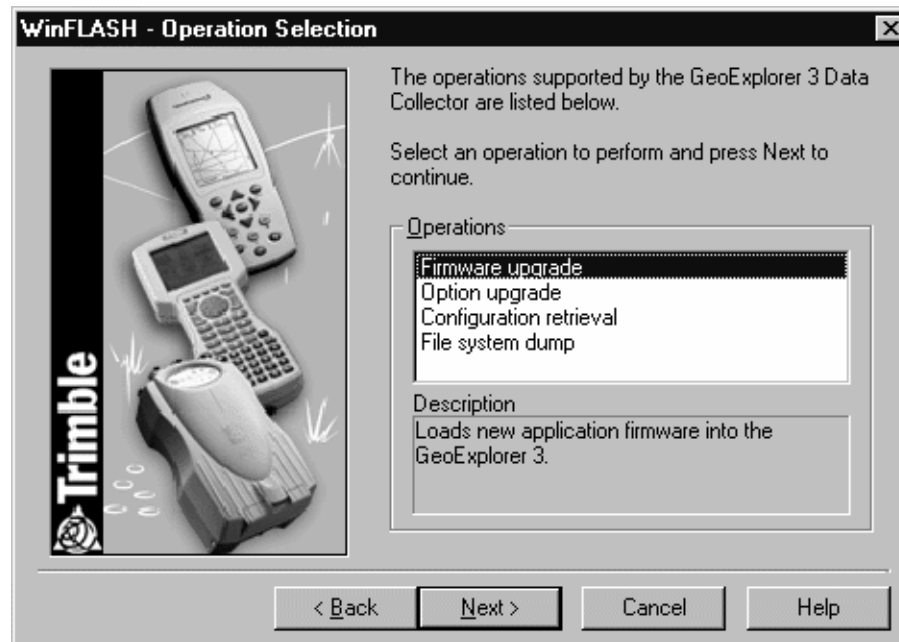
7.   Select the Option upgrade option and click **Next**.

The following dialog appears:
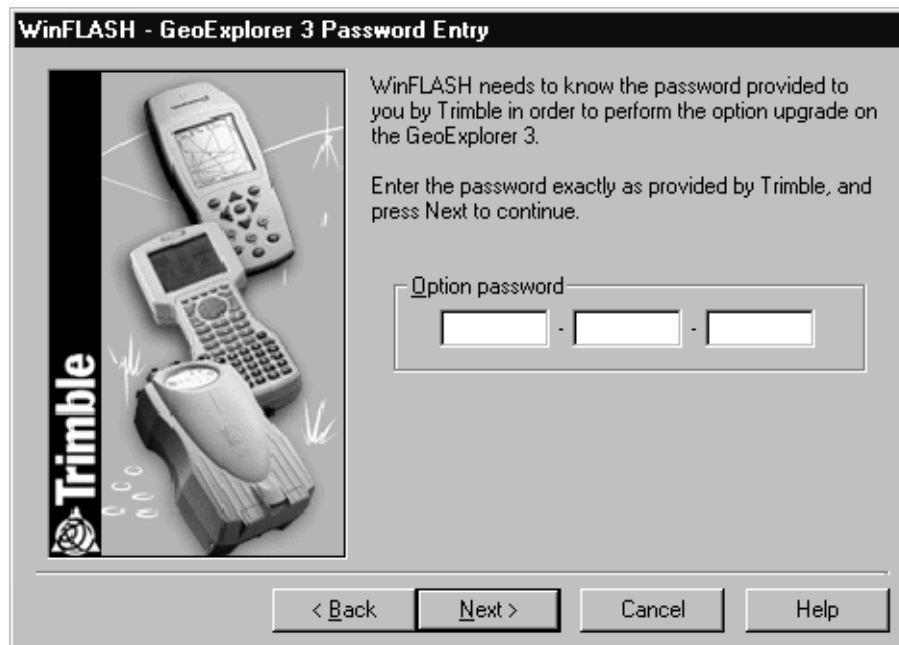
8.   Enter the password exactly (including matching case) as provided by Trimble and click **Next**.

The GeoExplorer 3 Firmware Selection dialog appears similar to the following:

9.   Select the firmware version you want to install onto your GeoExplorer 3 and click **Next**.

The Settings Review dialog appears similar to the following:

10. Review the current settings and click **Finish**. The program initiates communication with the GeoExplorer 3.

Installing the Firmware

A dialog similar to the following appears, indicating the progress status of the firmware installation:
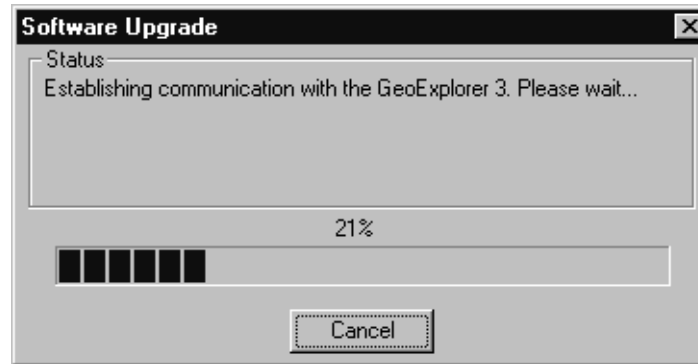
The installation takes about five minutes. Typically, the transfer of the GeoExplorer 3 firmware to the data collector proceeds automatically.

When the installation has completed, the following dialog appears on your computer:

11. Click **Exit** to close the WinFlash program.

12. Your GeoExplorer 3 reboots and automatically starts the newly installed firmware.

    The Trimble logo screen appears just after rebooting, identifying the new GeoExplorer 3 firmware and also showing the firmware version number.

WARNING Do not stop the option upgrade process on the computer or the GeoExplorer 3 once it has started. Doing so may corrupt the firmware. If this occurs, you may need to return your GeoExplorer 3 to Trimble for servicing.

Installing the Firmware

31.3 Installing the GeoExplorer 3 or GeoExplorer 3c Firmware

This section describes how to install the GeoExplorer 3 firmware onto the GeoExplorer 3 data collector. (You should also follow these instructions if you want to install a new version of the GeoExplorer 3c firmware.)

You can perform the installation using either an external or the internal power source, as described in the following sections:

- Installing the Firmware Using an External Power Source (using the GeoExplorer 3 support module)

- Installing the Firmware Using the Internal Power Source (using the GeoExplorer 3 lithium battery)

CAUTION The firmware installation process completely erases the contents of the GeoExplorer 3 data collector's memory. Make sure that all data files and waypoints are transferred to your computer before installing the firmware.

31.3.1 Installing the Firmware Using an External Power Source

To install the GeoExplorer 3 firmware using the GeoExplorer 3 support module as an external source of power:

1. Connect the equipment listed in Equipment Required for Installation (see page 31-2):

2. Plug the GeoExplorer 3 support module in to the wall current (mains).

3. Connect the GeoExplorer 3 support module to the COM1 or COM2 serial port of the computer using the supplied null modem cable (part number 18532).

4. Place your GeoExplorer 3 data collector into the GeoExplorer 3 support module.
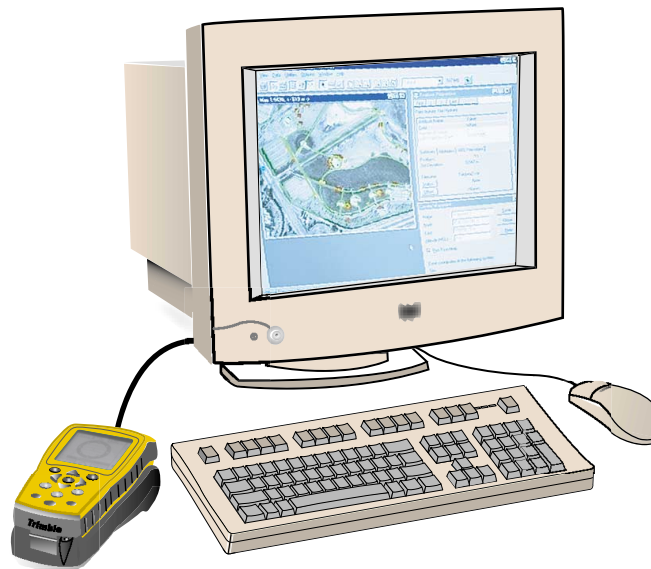
5. Turn on the GeoExplorer 3 and computer if they are not already on. Check the Status screen on the GeoExplorer 3 to make sure the unit is being powered externally:
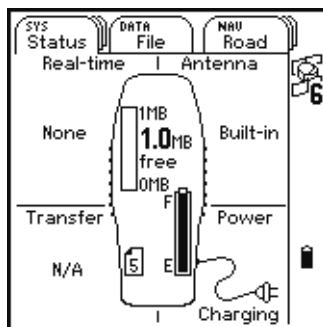
You are now ready to install the firmware. See Proceeding with the Installation, page 31-23.

31.3.2 Installing the Firmware Using the Internal Power Source

To install the GeoExplorer 3 firmware using the internal lithium battery of the GeoExplorer 3 as the power source:

1. Connect the equipment listed in Equipment Required for Installation (see page 31-2) as shown in the following diagram:
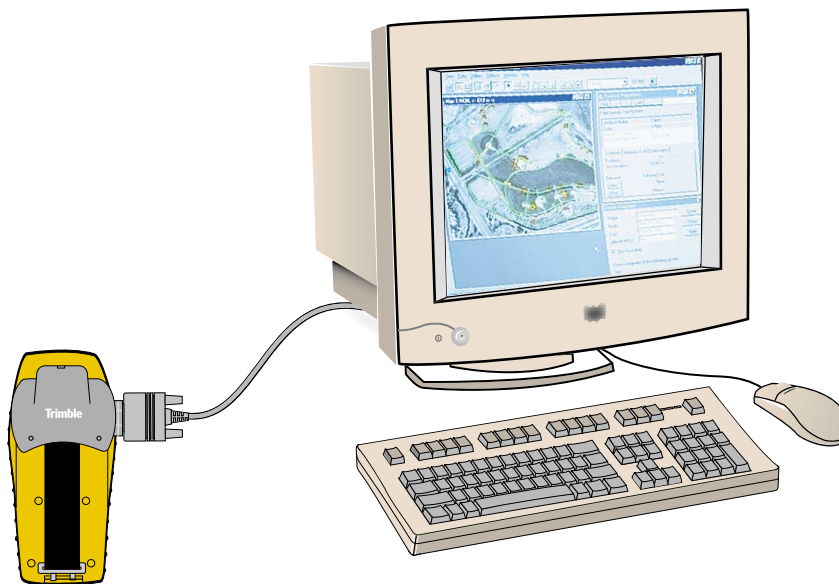
2. Connect one end of the null modem cable (part number 18532) to the serial clip. Connect the other end of the null modem cable to the COM1 or COM2 serial port of your computer.

3.   Turn on the GeoExplorer 3 and office computer if they are not already on. Check the Status screen on the GeoExplorer 3 to make sure the unit is being powered internally:

You are now ready to install the firmware. See Proceeding with the Installation, page 31-23.
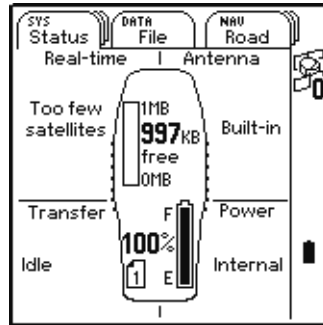
Installing the Firmware

31.3.3 Proceeding with the Installation

1.   On the GeoExplorer 3, go to the Setup tab and select **Reset**. The following menu appears:
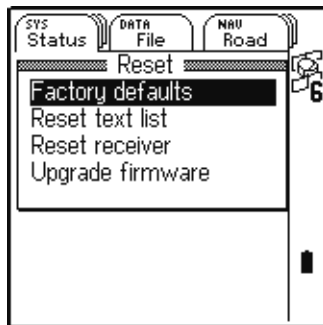
2. Select Upgrade firmware. You are asked to confirm this action. Begin the option upgrade when the following screen appears:
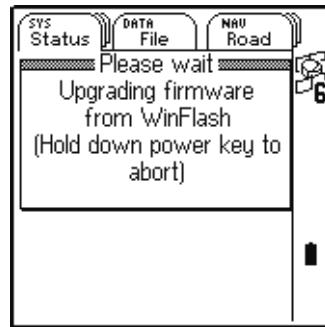
3. On your office computer, start the WinFlash software. To do this, from the Windows Start menu select Programs / WinFlash / WinFlash.

NOTE For the firmware installation to proceed, the WinFlash software, which is used to install the GeoExplorer 3 firmware onto your GeoExplorer 3 data collector, must be installed onto your office computer, along with the GeoExplorer 3 firmware you want to install. The WinFlash program and GeoExplorer 3 firmware can be downloaded from www.trimble.com, or installed from the installation CD.

A dialog similar to the following appears:

4.   Select GeoExplorer 3 Data Collector as the device type.
5.   Specify the serial (COM) port that your GeoExplorer 3 is connected to.

Installing the Firmware

6. Click **Next**. The Operation Selection dialog appears:
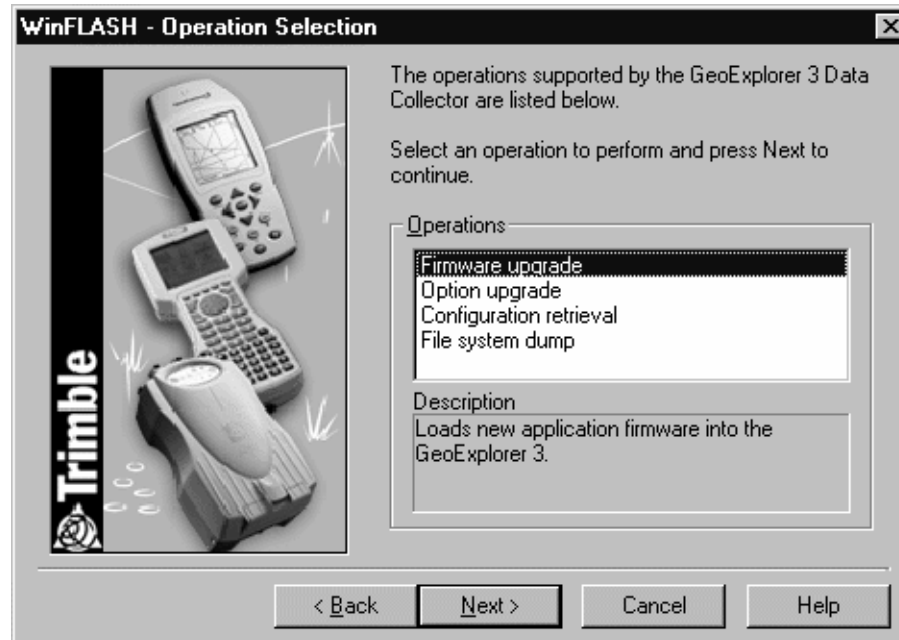
7. Select the Firmware upgrade option and click **Next**.

The GeoExplorer 3 Firmware Selection dialog appears similar to the following:

8.   Select the firmware version you want to install onto your GeoExplorer 3 and click **Next**.

Installing the Firmware

The Settings Review dialog appears similar to the following:

9. Review the current settings and click **Finish**. The program initiates communication with the GeoExplorer 3.

A dialog similar to the following appears, indicating the progress status of the firmware installation:

The installation takes about five minutes. Typically, the transfer of the GeoExplorer 3 firmware to the data collector proceeds automatically.

Installing the Firmware
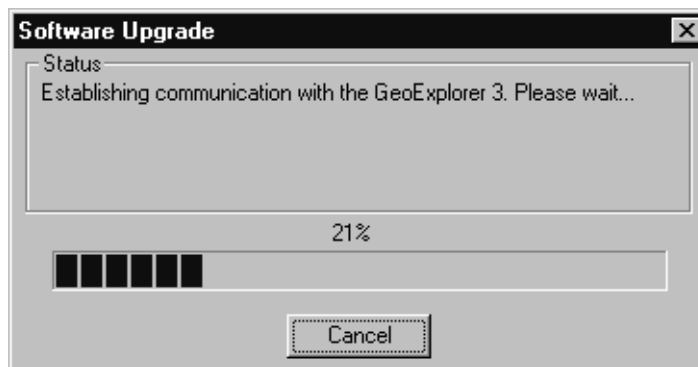
When the installation has completed, the following dialog appears on your computer:
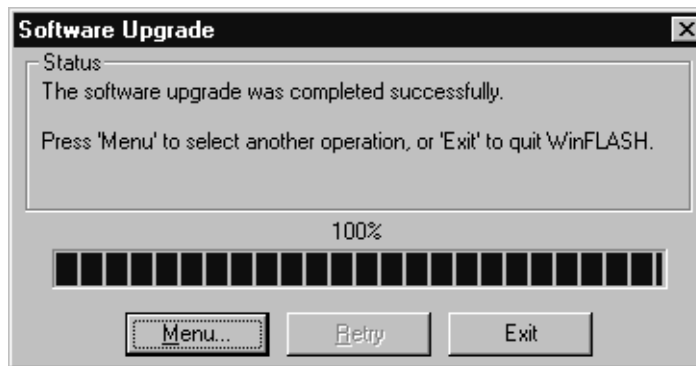
10. Click **Exit** to close the WinFlash program.

11. Your GeoExplorer 3 reboots and automatically starts the newly installed firmware.

    The Trimble logo screen appears just after rebooting, identifying the new GeoExplorer 3 firmware and also showing the firmware version number.

WARNING Do not stop the firmware installation process on the office computer or the GeoExplorer 3 once it has started. Doing so may corrupt the firmware. If this occurs you may need to return your GeoExplorer 3 to Trimble for servicing.

GLOSSARY

This section defines technical terms and abbreviations used in this manual.

.cor file

A file with a .cor extension that has been created by the Differential Correction utility in the GPS Pathfinder Office software, but uses the .ssf file (see Glossary-1) format.

.imp file

A file with an .imp extension that has been created by the Import utility in the GPS Pathfinder Office software, but uses the .ssf file (see Glossary-1) format.

.ssf file

A Trimble Standard Storage Format (SSF) data file that stores GPS data from a mapping receiver.

almanac

An almanac is data, transmitted by a GPS satellite, which includes orbit information on all the satellites, clock corrections, and atmospheric delay parameters. The almanac is stored on the GeoExplorer 3. It is used to facilitate rapid acquisition of GPS signals when you turn the GeoExplorer 3 on, or when you have lost track of satellites and are trying to regain GPS signals.

attributes

Attributes are the characteristics of a feature (see Glossary-8) in a Geographic Information System (GIS). For example, a road may have a name or designation number, surface type, width, or a number of lanes. Each of these factors are attributes of the road feature, and could have a range of possible values.

The value chosen to describe a particular feature is called the attribute value. In our example of a road feature, PINE ROAD could be the name value of the attribute and ASPHALT could be the surface type attribute.

averaged vertex

A point on a line or area feature that is averaged from one or more GPS positions.

base station

A base station is a GPS antenna and receiver positioned on a known location specifically to collect data for differential correction (see Glossary-6). Base data needs to be collected at the same time as you collect data on a rover unit. Base stations can be permanent stations that collect base data for provision to multiple users, or a rover unit that you locate on known coordinates for the duration of your datalogging session.

baud

Baud is a unit used to measure the speed of electronic code transmissions, generally one bit per second. The higher the baud rate, the faster the transfer of data. However, both the input and output device must be configured to the same baud rate for data to be successfully transferred.

bearing

A bearing is the direction from one point to another, usually measured clockwise from north. On the GeoExplorer 3, the bearing indicates the direction from your current position to the target waypoint or feature.

carrier phase

Carrier phase is the difference between the radio wave signal generated by your GeoExplorer 3 and the radio wave signal coming in from the satellite.The carrier phase is used to very accurately compute the distance to a satellite, which increases the accuracy of your position.

GPS satellites transmit on a frequency of 1575.42 MHz.

code phase (C/A code)

(also known as Course Acquisition code)

The difference between the pseudorandom number (see Glossary-15) code generated by your GeoExplorer 3 and the pseudorandom number code coming in from the satellite. The code phase data is used to quickly compute the distance to a satellite and therefore calculate your position.

data dictionary

A data dictionary is a description of the objects to be collected for a particular project or job. It is used in the field to control the collection of the spatial and attribute information about these objects. The elements of a data dictionary could include a point, line, and area feature (see Glossary-8).

datum

A datum is a mathematical model of the earths surface. World geodetic datums are typically defined by the size and shape of an ellipsoid (see Glossary-7) and the relationship between the center of the ellipsoid and the center of the earth.

Because the earth is not a perfect ellipsoid any single datum will provide a better model in some locations than others. Therefore, various datums have been established to suit particular regions. For example, maps in Europe are often based on the European datum of 1950 (ED-50).

Maps in the United States are often based on the North American datum of 1927 or 1983 (NAD-27, NAD-83). All GPS coordinates are based on the WGS-84 datum surface.
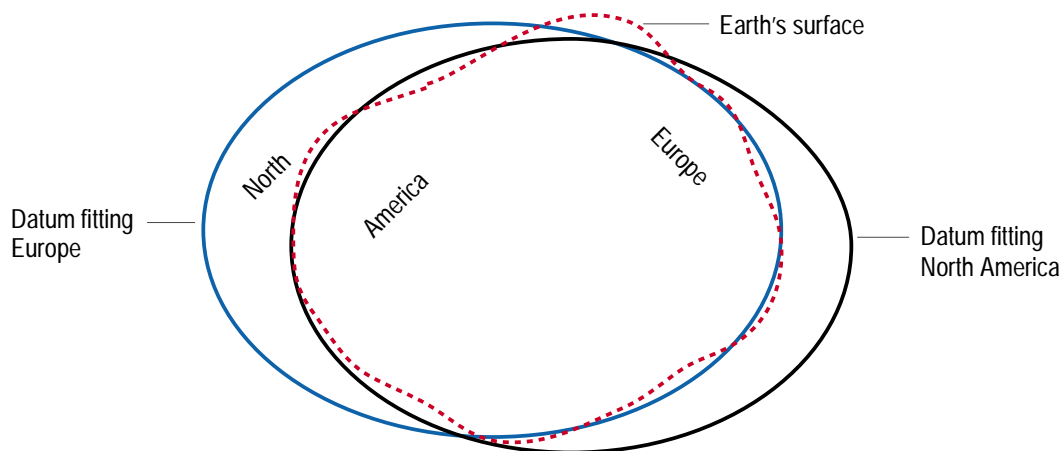
For more information, refer to the GPS Mapping Systems General Reference, or see Coordinate Systems, page 13-1.

declination

See magnetic declination (see Glossary-12).

differential correction

Differential correction is the process of correcting GPS data collected on a rover (see Glossary-16) with data collected simultaneously at a base station (see Glossary-3). Because it is on a known location, any errors in data collected at the base station can be measured, and the necessary corrections applied to the rover data.

Differential correction can be done in real-time differential GPS (see Glossary-16) or after the data has been collected by postprocessing (see Glossary-15).

ellipsoid

An ellipsoid is the 3D shape that is used as the basis for mathematically modeling the earths surface. The ellipsoid is defined by the lengths of the minor and major axes. The earths minor axis is the polar axis and the major axis is the equatorial axis.
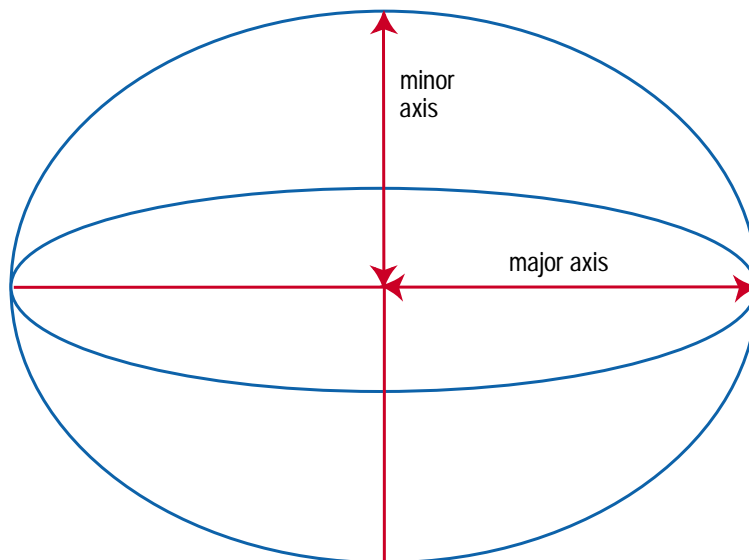
minor
axis

major axis

For more information, refer to the GPS Mapping Systems General Reference, or see Coordinate Systems, page 13-1.

feature

A feature is a physical object or event that has a location in the real world, and about which you want to collect position and/or descriptive information. Features can be divided into points, lines and areas. For example, a water faucet is a point feature, a road is a line feature and a lake is an area feature.

Features are defined in a data dictionary (see Glossary-4).

geoid

A geoid is a 3D surface representing mean sea level (MSL) if it was projected to extend through the continents. Unlike an ellipsoid (see Glossary-7) or datum (see Glossary-5), which have a symmetrical surface, the geoid undulates perpendicular to the force of gravity.
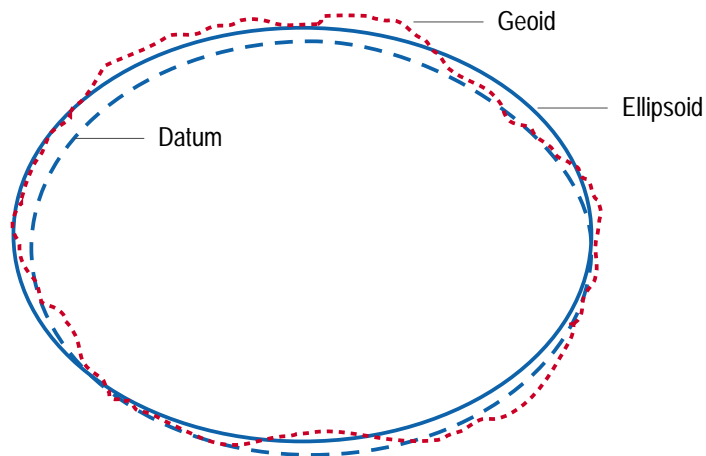
For more information, refer to the GPS Mapping Systems General Reference, or see Coordinate Systems, page 13-1.

GGA message

A GGA message is a NMEA (see Glossary-14) message containing GPS time, position, and "fix" (type of position) information. GGA messages can be used to pass GPS positions from a GPS datalogger to marine navigation equipment.

great-circle distance

The great-circle distance is the shortest distance between two points on the surface of a sphere.

HAE

Height Above Ellipsoid

HAE is a method for referencing altitude. Altitudes expressed in HAE are actually giving the height above the datum (see Glossary-5). GPS uses the WGS-84 (see Glossary-18) datum and all heights are collected in relation to this surface. It is important to use the same datum when comparing altitudes in HAE.

heading

The heading is the direction you are facing or traveling, usually measured clockwise from north.

horizon

The line at which the earth and sky seem to meet.

ionospheric noise

The effects that the ionosphere has on GPS signals. The ionosphere is the band of charged particles 100 to 200 kilometers (60 to 125 miles approximately) above the surface of the earth.

latitude

Latitude is an angular measurement made from the center of the earth to north or south of the equator. It comprises the north/south component of the latitude/longitude coordinate system, which is used in GPS data collection.

Traditionally, north is considered positive, and south is considered negative.

longitude

Longitude is an angular measurement made from the center of the earth to the east or west of the Greenwich meridian (London, England). It comprises the east/west component of the latitude/longitude coordinate system, which is used in GPS data collection.

Traditionally, east is considered positive, and west is considered negative.

magnetic declination

Magnetic declination is the difference between magnetic north and true north (see Glossary-17). Declination is expressed as an angle and differs between locations.

magnetic north

Uses the north magnetic pole as the reference to north.

Mean Sea Level (MSL)

Mean Sea Level (MSL) is a method of altitude reference. Altitudes expressed in relation to MSL actually give a height above the geoid (see Glossary-9).

It is important to use the same geoid when comparing altitudes in MSL.

multipath

Multipath occurs when GPS signals arrive at the datalogger having traveled different paths. For example, this may happen if some signals are reflected off a building, before reaching the datalogger. If a signal takes a longer path it will show a larger distance to the satellite and therefore decrease position accuracy.
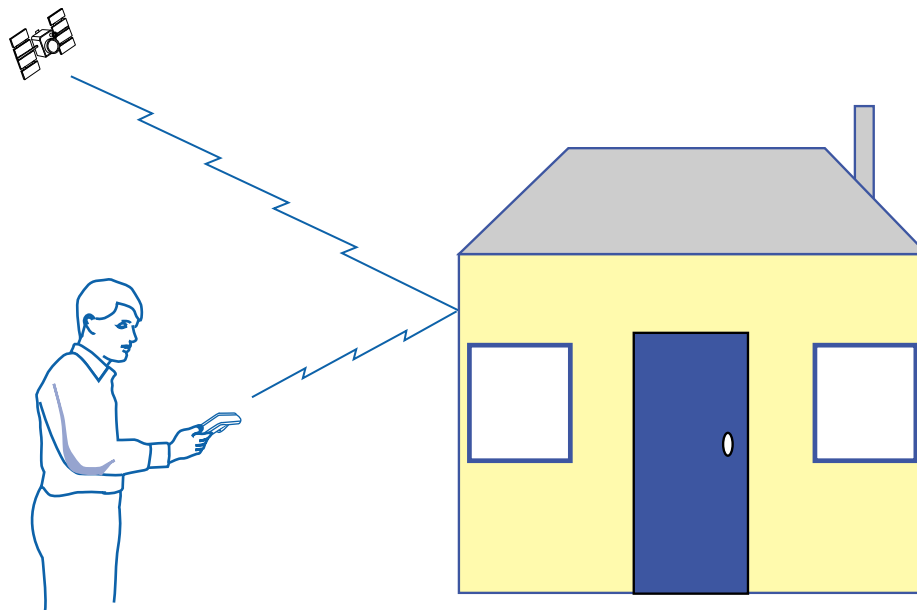
For more information, refer to the GPS Mapping Systems General Reference.

NAD-27

North American Datum of 1927. A horizontal datum (see Glossary-5) employing the Clarke 1866 ellipsoid (see Glossary-7). Height values of this era are expressed in NGVD (National Geodetic Vertical Datum) of 1929.

NAD-83

North American Datum of 1983. A horizontal datum (see Glossary-5) employing the GRS-80 ellipsoid (see Glossary-7). Its geometric definition is almost identical to the WGS-84 (see Glossary-18). For GPS purposes, the NAD-83 and WGS-84 datums are identical.

NMEA

NMEA is a standard, established by the National Marine Electronics Association (NMEA). The standard defines electrical signals, data transmission protocol, timing and sentence formats for communicating navigation data between marine navigation instruments.

The GeoExplorer 3 uses these standards to communicate to marine navigation instruments.

parity

A digital message is composed of 0's and 1's. Parity is a form of error checking that sums the 0's and 1's of the digital message. A parity error results when one of the bits is changed so that the parity calculated at message reception is not the same as it was at message transmission. Options for parity checking include even, odd, and none.

Typically you should have the same parity setting on your GeoExplorer 3 as on the external device you are communicating with.

postprocessing

Postprocessing is the processing of satellite data after it has been collected, in order to eliminate error. This involves using PC software to compare data from the rover to data collected at the base station.

Because the base station is on a known location any errors can be determined and removed from the rover data.

pseudorandom number

The pseudorandom number (PRN) is the code of 0's and 1's transmitted by GPS satellites, which appears to be random "noise", but is actually a complex pattern that can be exactly reproduced.

Each satellite has its own unique PRN code, which together are used by the GeoExplorer 3 to calculate code phase (C/A code) (see Glossary-4) positions.

real-time differential GPS

(also known as real-time differential correction, DGPS)

Real-time differential GPS is the process of correcting GPS data as you collect it. This is achieved by having corrections calculated at a base station sent to the data collector a few seconds in advance using a radio link. As the rover receives the position it applies the corrections to give you a very accurate position in the field.

Real-time differential correction is usually applied to code phase (C/A code) (see Glossary-4) positions.

rover

A rover is any mobile GPS datalogger collecting or updating data in the field, typically at an unknown location. Data collected on a rover can be differentially corrected relative to base station data.

RTCM

Radio Technical Commission for Maritime Services (RTCM)

A commission established to define a differential data link for the real-time differential correction of roving GPS receivers. There are two types of RTCM differential correction message. However, all Trimble GPS receivers use the newer version 2 RTCM protocol.

true north

Uses the north celestial pole as the reference to north.

UTC

Universal Time Coordinated.

UTC is a time standard based closely on local solar meantime at the greenwich meridian (GMT). GPS time is directly related to UTC.

UTM

Universal Transverse Mercator Map Projection.

A special case of the Transverse Mercator projection. Abbreviated as UTM, it consists of 60 north/south zones, each 6 degrees wide in longitude.

velocity

Velocity is essentially a measure of speed, that takes into account direction of travel as well as the distance traveled over a period of time.

VTG message

An NMEA (see Glossary-14) message containing actual track made good and speed over ground.

waypoint

A waypoint is a geographical point that, unlike a feature, holds no attribute information beyond a name and location. Typically waypoints are used to denote objects whose locations are of primary interest, such as a survey mark. Waypoints are most often used for navigation.

WGS-84

WGS-84 is an abbreviation for World Geodetic System 1984. WGS-84 has superceded WGS-72 as the datum (see Glossary-5) used by GPS since January 1987.

The WGS-84 datum is based on the ellipsoid (see Glossary-7) of the same name.

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Reader Comment Form

GeoExplorer 3 Operation Guide　　　　**May 2001**　　　　　**P/N 39628-20-ENG**　　　　　**Revision A**

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